

The STAR LINE



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THE STAR LINE

Comprising Dairy Barn Equipment, Stalls, Stanchions, Stock Pens, Litter, Feed and Milk Can Carriers, Hay Carriers, Barn and Garage Door Hangers, Stock Tank Heaters, Wire Stretchers, Hoists, Coaster Wagons and Hardware Specialties



Copyrighted 1919

Hunt, Helm, Ferris & Co.

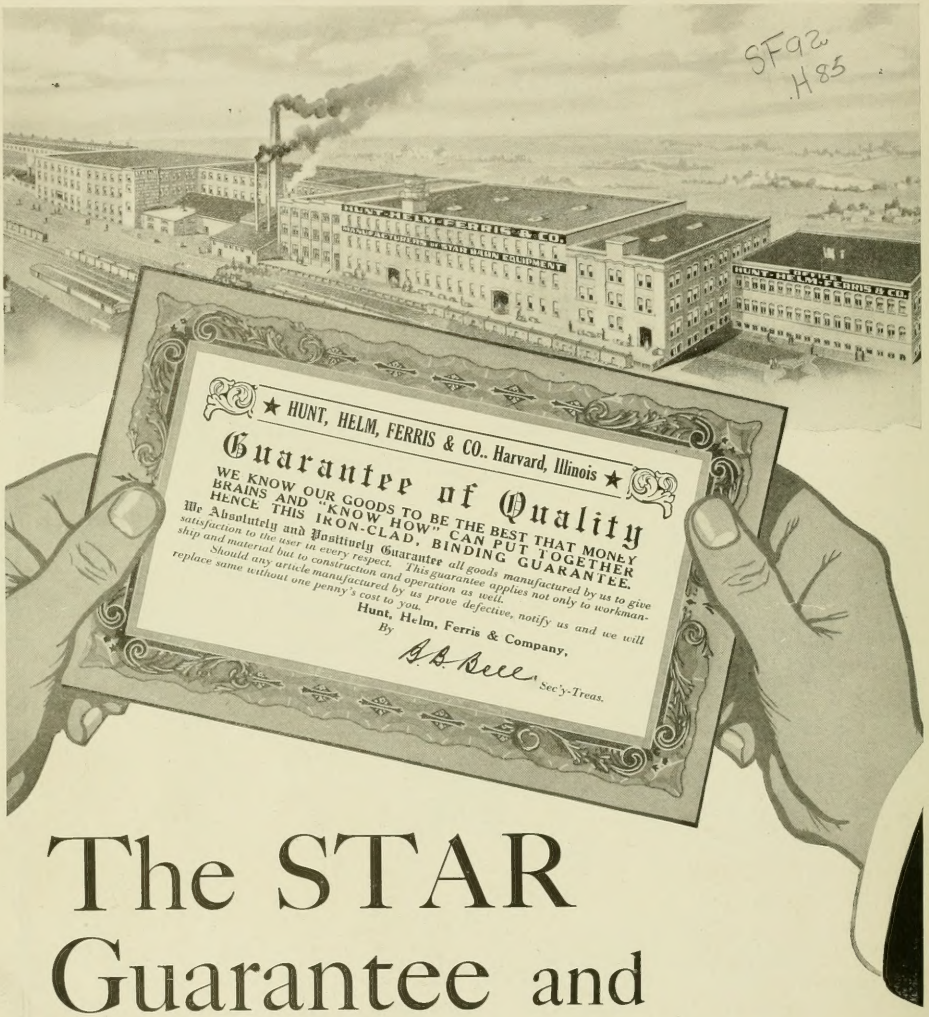
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and

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The STAR Guarantee and The Factory Behind It

MAY 22 1919

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Let Us Work Together

YOUR interests and ours are mutual. You want the best you can find in barn equipment—we want to satisfy you. Whether you are a dealer or a user of our products, we place a great value on your good will. Our business is to serve you and we hope you will help us to do this in the best way possible.

Everlastingly At It

When a man does the same thing over and over again, year after year, he is bound to do that one thing well.

This is the order in the Hunt, Helm, Ferris & Co. factories, manufacturing STAR Equipment.

The STAR Line is backed by long experience. The officers of this Company have been dairy farmers for many years, and still own and operate practical dairy farms. Combined with this is the experience we have had in supplying the needs of dairymen farmers in all parts of the country. We have had the practical experience which qualifies us to know how to plan your equipment and to produce it at reasonable cost.

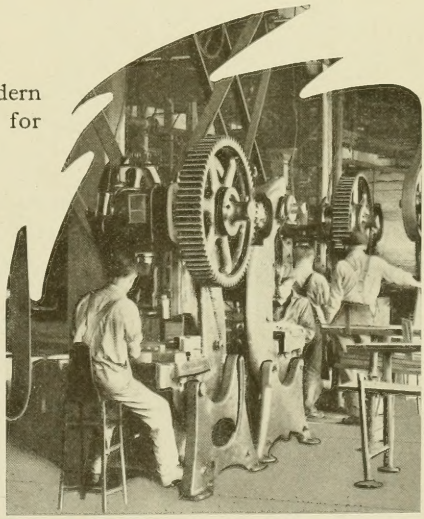
Long experience is a big asset in this business. It invites confidence—establishes reliability and assures you of satisfactory service.

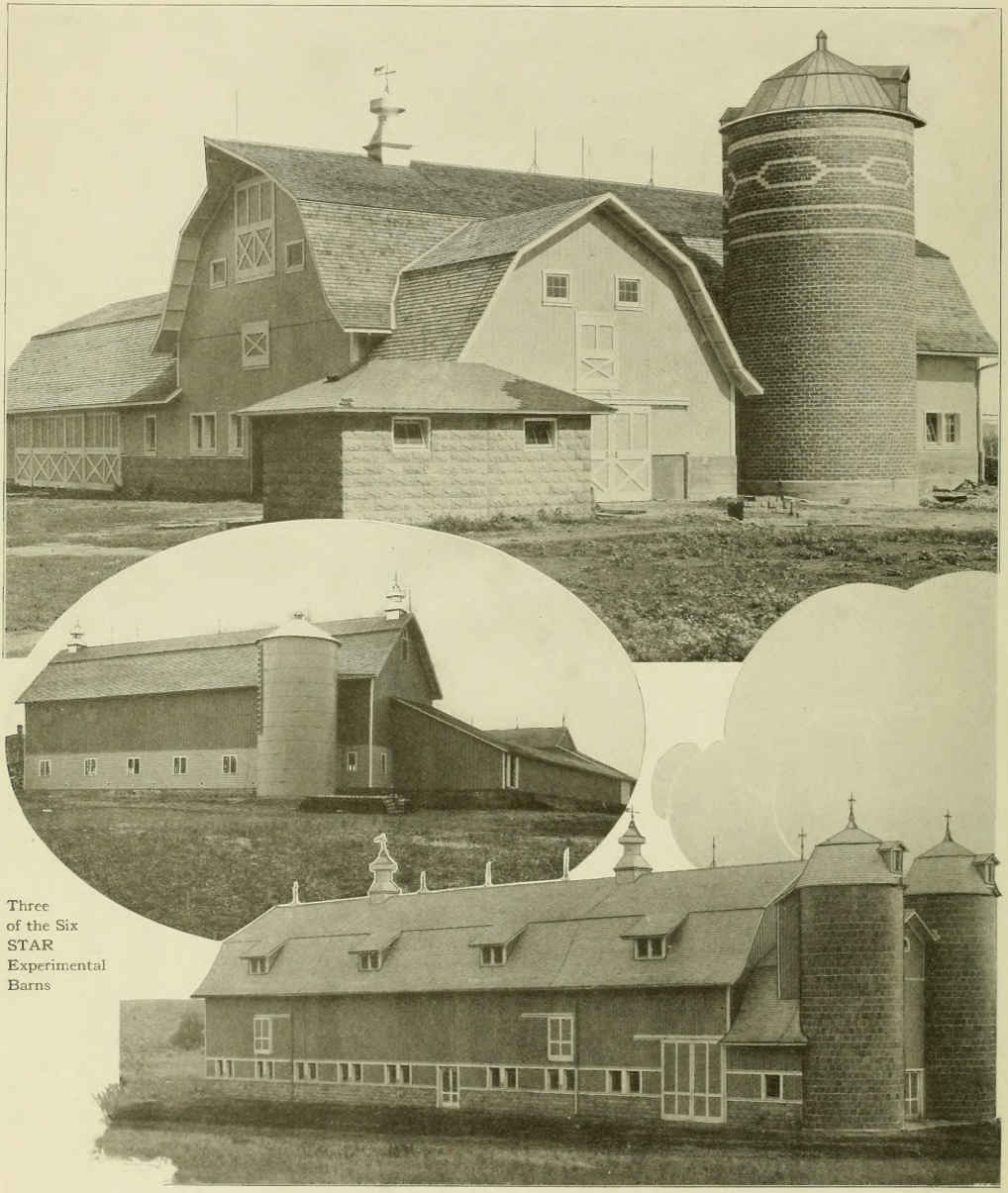
Everything for the Barn

We are complete outfitters of modern barns. We originate and draw plans for the building—we supply every part of equipment that goes into it.

This means much to the STAR dealer and his customer. He does not have to go to one concern for one part of his equipment, and to some other concern for another, and so on, but can get all of his requirements fulfilled by one company.

Here is a uniform standard of quality, convenience in ordering and receiving shipments, certainty of satisfactory results and no division of responsibility.





Three
of the Six
STAR
Experimental
Barns

We Stand Back of Our Goods

We have spent many years building up a nation-wide reputation for STAR Line Equipment. Naturally we want to protect the name of our products.

Read the guarantee on Page 2. It covers all STAR Goods and we live up to it to the letter.

We not only stand back of our goods but do our best to take care of our customers at all times. We can point with pride to prompt shipments as a regular thing in our business. And there are times when promptness in filling orders is urgently needed.

We Are Constantly Experimenting

Improvements are always possible in almost any article. We are always looking for ways to improve the different articles in STAR Line Equipment.

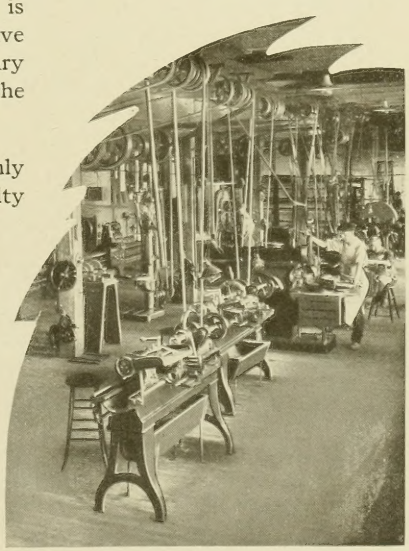
Our experimental department is constantly devoted to this work here in our factory. In addition, we have six experimental barns near Harvard in which new features are tried out.

This work accounts for the many big exclusive features in the STAR Line. It is responsible for many of the new ideas we have introduced for keeping the barn more sanitary and for saving time and work in the building.

In the STAR Line you will find not only everything for the barn but features for utility and convenience that place the STAR Line above and beyond any other line of equipment in giving you the most for your money.

We want to serve you to the best of our ability. We have had the experience, we have the equipment and are ready for the outfitting of any farm building.

Tell us your needs. Let us work together.



Exclusive

LOVELAND FARMS CO.,
Omaha, Nebraska,
July 25, 1918

Hunt, Helm, Ferris & Co.,
Harvard, Illinois.
Gentlemen:

The complete equipment you furnished for our Dairy Barn five years ago has given perfect satisfaction. We have had occasion to call on your Omaha representative for assistance, and have always found him more than willing to assist us. We like your service.

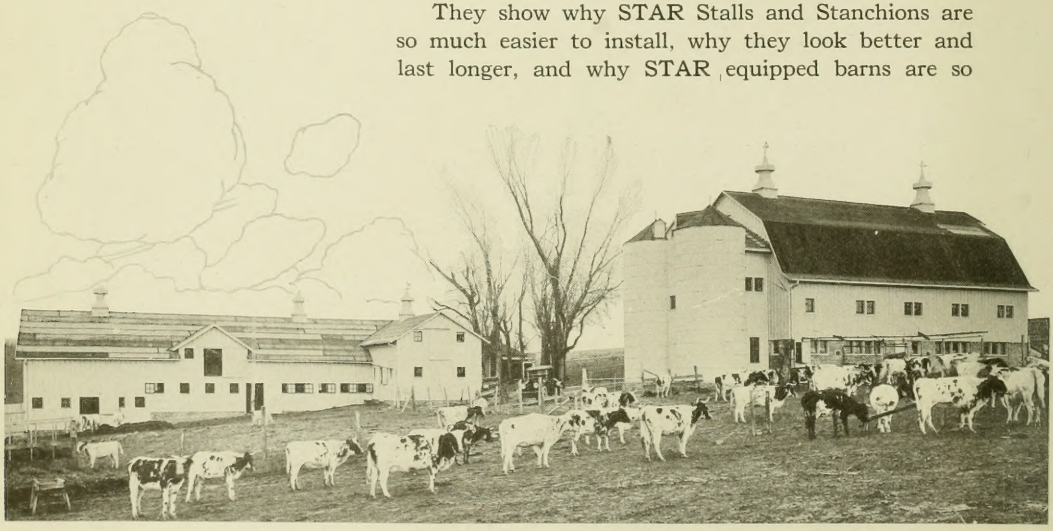
THE LOVELAND FARMS COMPANY,
(Signed) A. J. Love, President.

The photograph below shows a view of Loveland Farms

EVEN if you don't read another page in this entire book, don't miss the next few pages showing exclusive STAR features.

Here are the features that make STAR Barn Equipment different.

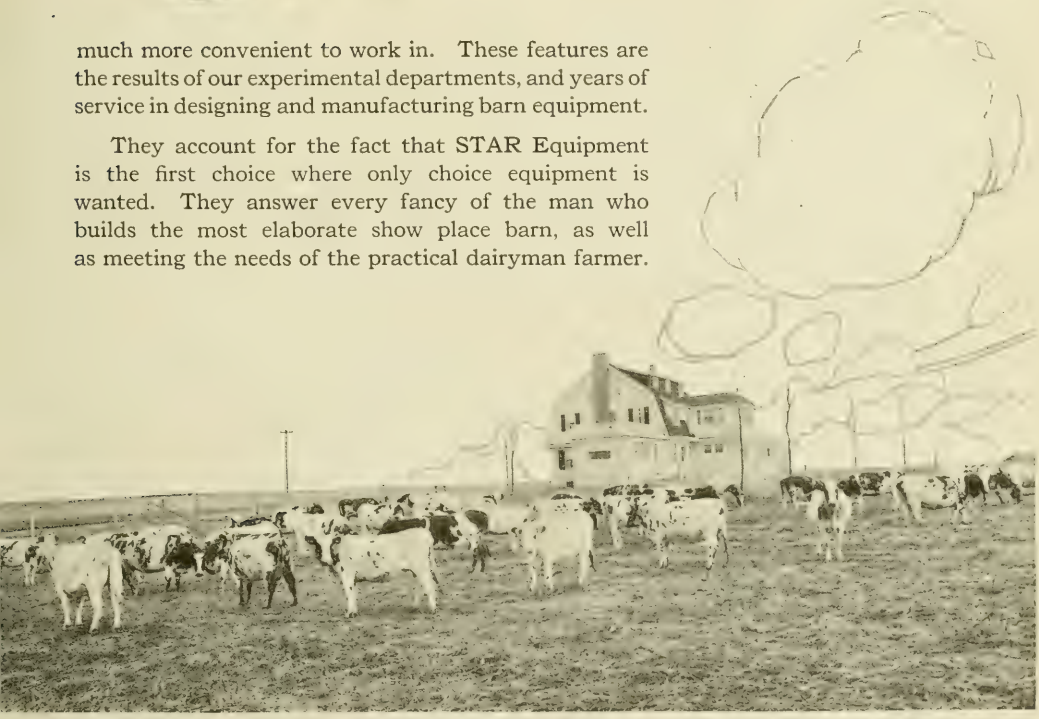
They show why STAR Stalls and Stanchions are so much easier to install, why they look better and last longer, and why STAR equipped barns are so

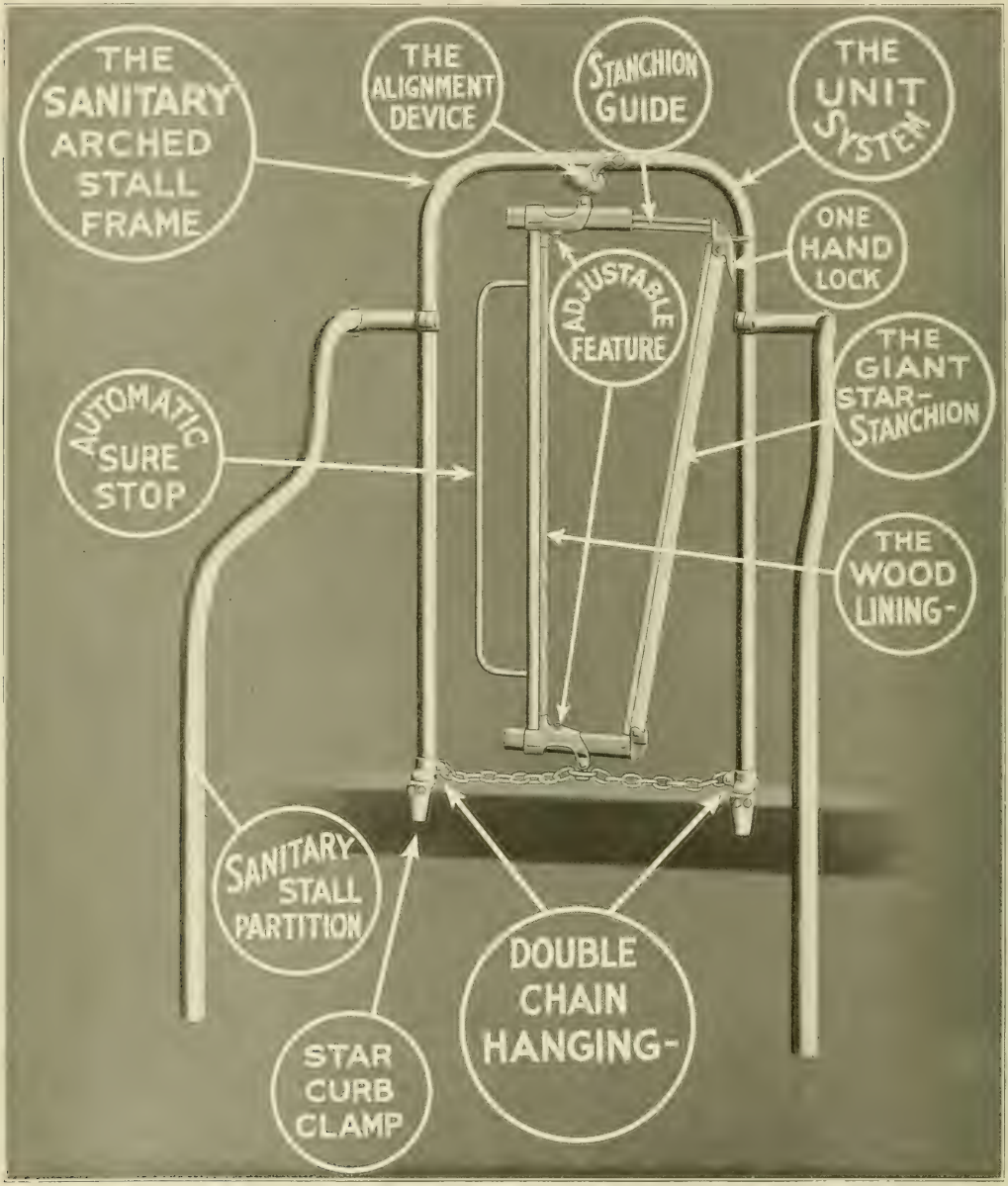


STAR Features

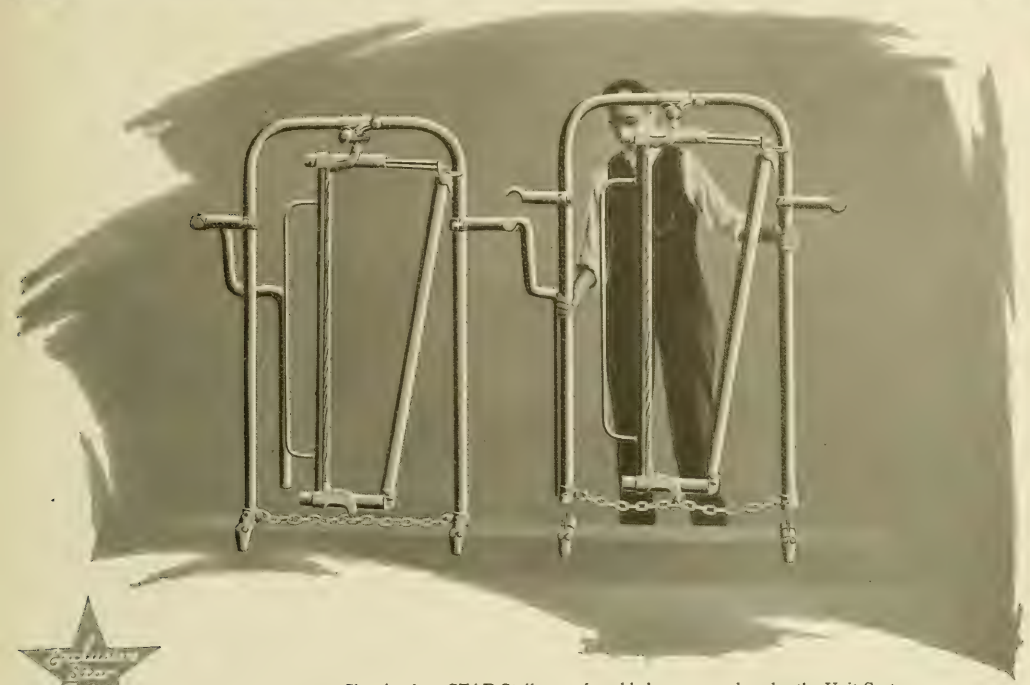
much more convenient to work in. These features are the results of our experimental departments, and years of service in designing and manufacturing barn equipment.

They account for the fact that STAR Equipment is the first choice where only choice equipment is wanted. They answer every fancy of the man who builds the most elaborate show place barn, as well as meeting the needs of the practical dairyman farmer.





EXCLUSIVE STAR FEATURES



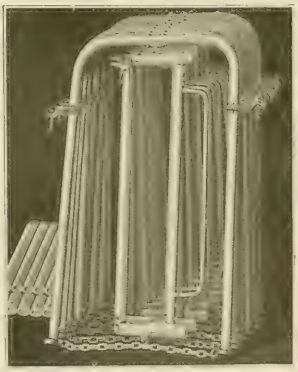
Showing how STAR Stalls may be added or removed under the Unit System

The Star Unit System

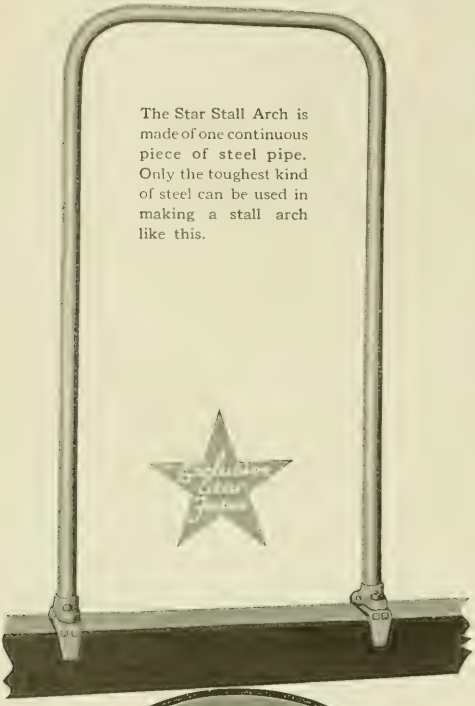
"Grows with your Herd—One Stall or a Hundred"

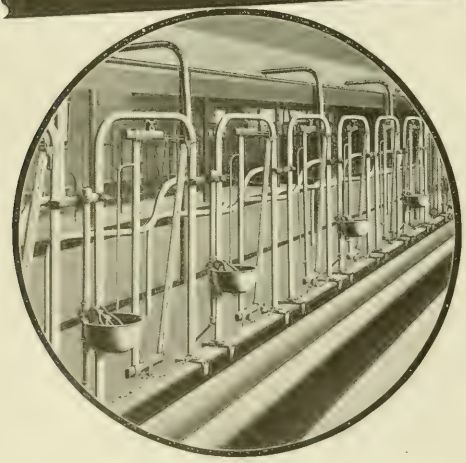
HERE is one of the main reasons why all dairymen prefer STAR Barn Equipment. STAR Stalls are built individually. Each stall is a separate unit and connects with the next on either side. You can install as many as you need to exactly fit your herd. And you can always add more as your herd increases.

This exclusive STAR feature saves much in installation expense. The stalls go into the barn just as they leave the factory. Simply clamp them to the concrete curb and you have the complete unit, stanchion and all, ready for business.



This shows the way STAR Stalls come to you—ready for installation the minute they arrive





The Arched Stall

Shows the Quality of Steel Star Goods are Made of

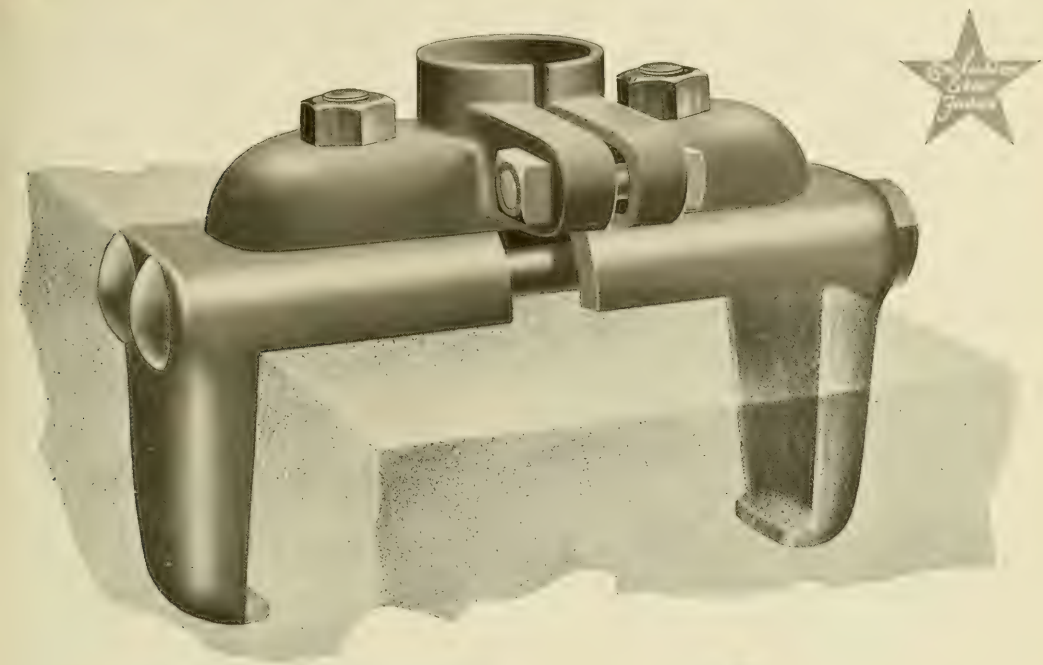
IT is impossible to use anything but the highest grade of steel in the manufacture of STAR Steel Stalls. As you can see in the illustration here, the STAR Stall Arch is made of one continuous piece of round steel pipe. There are no clamp irons, couplings or other devices on it. It is a complete frame in ONE piece.

There is a big advantage in this. It makes a more sanitary equipment. Having no clamps or couplings, there are no places to catch dust and dirt. The equipment is easier to keep clean.

This is one of the reasons why STAR Equipment is selected where the most rigid rules on sanitary conditions are to be complied with.

Only the toughest of steel can be used to form this type of stall. The pipe is formed into shape without heating the metal. If inferior steel was used, very likely it would give out at the round corners of the arch. It would not stand up under the bending process. Take a piece of ordinary steel tubing and bend it and see what happens. It will show you that there is a big difference in the quality of metals.

But, the result of a right selection of material is worth while. You get not only a more sanitary equipment but a more durable and better job of installation.



The Star Curb Clamp

"Sixty Seconds Sets a Star Stall"

THIS simple device has answered a big problem in barn equipment installations. It does away with anchors or templates. It enables you to go ahead with your concrete or cement work and finish the job before the equipment reaches you. It enables you to build the floor and curb with less work and at less expense, and to avoid the possibility of costly errors in getting stalls in the wrong place. It simplifies the entire job of installation.

Simply drop the curb clamps over the curb and tighten the bolts. Then bolt the stall arches to them and the job is done. Simple and convenient, and a permanently satisfactory installation.

This is a patented STAR feature. You will find it on no other barn equipment.

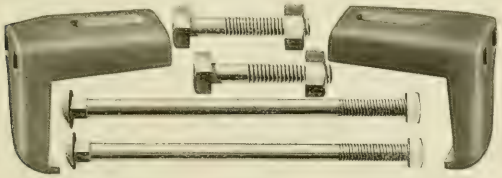
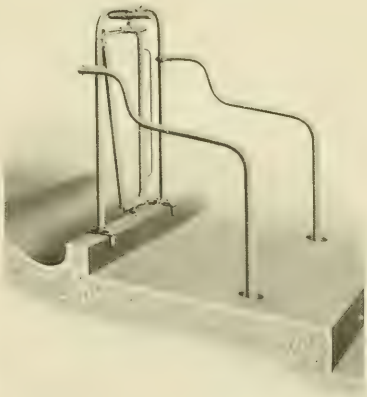


Fig. 685

The STAR Curb Clamp consists of just two malleable jaws, adjustable to the curb by means of draw bolts.



By leaving five inch holes in the cow bed, the distance apart that the stalls are wide, you are enabled to clamp the stall arches to the curb and to fill in around the partitions with thin, rich cement.

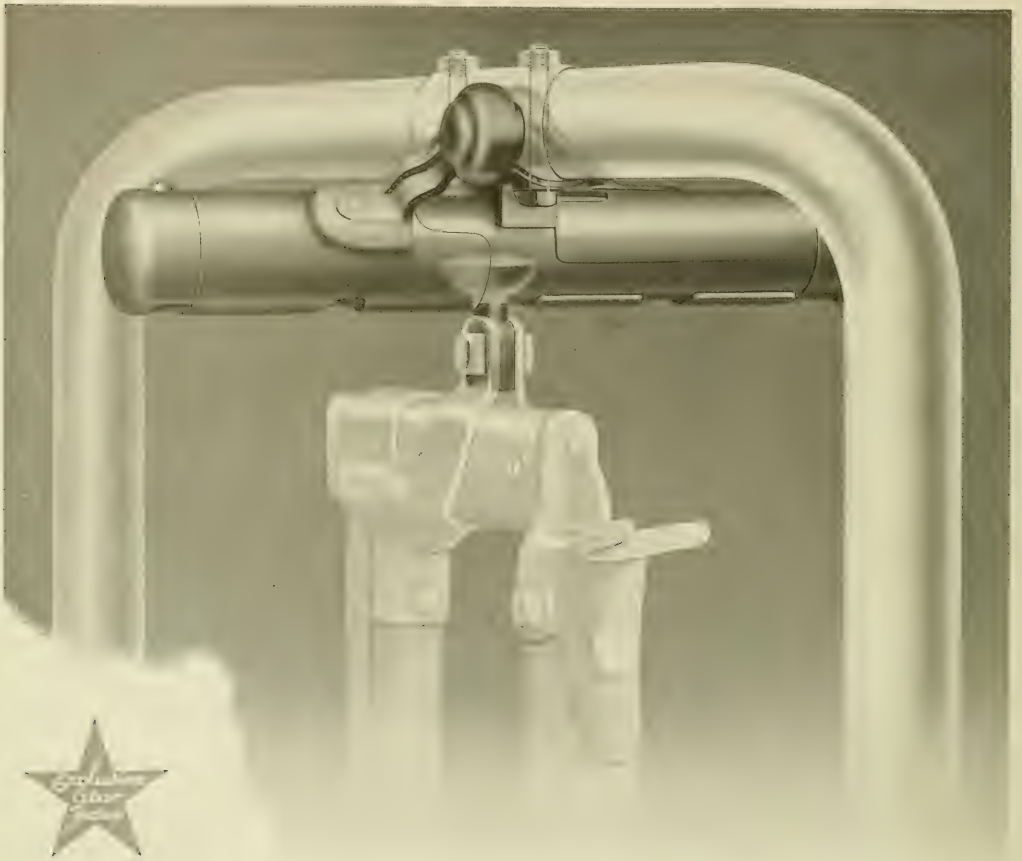


Fig. 765

The Star Alignment Device

"The Clean Stall Means a Clean Cow"

THIS exclusive STAR feature keeps every cow in line at the gutter. It keeps the stalls clean which means keeping the cows clean.

All cows are not of the same length. They vary in length just as people vary in height.



Star Equipped Barn, owned by M. P. Daw
Buhl, Idaho

But you want every cow to fit her stall comfortably and stand so that litter falls into the gutter instead of on the bedding.

The STAR Alignment Device provides for this. It instantly lengthens or shortens the cow bed.

And it takes no longer to make the adjustment than it does to lock the stanchion.

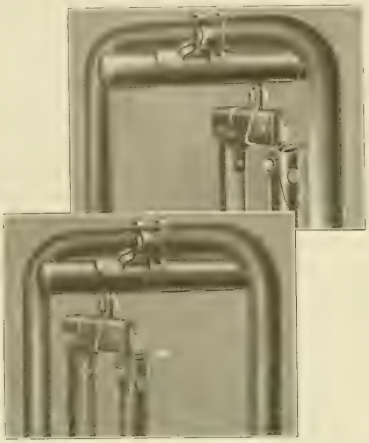
The adjustment is made instantly after the cow is in the stall. So easy to operate that a small boy can do it. No tools needed. Not even a monkey wrench.

Just raise the lever and move the stanchion forward for large cows or backward for short cows. Five different positions in eleven and one-half inches.

It does not matter whether the cow goes into the same stall each time or not. The Alignment Device instantly aligns her at the gutter. Regardless of how the herd changes, the STAR Alignment Device instantly adjusts the stanchion to the animal.

Here is the only alignment device which can be adjusted quickly enough to make it practical. It's the result of the experience and engineering skill back of STAR Equipment. It's one of the features that give the STAR Line leadership.

The stanchion can be placed in any of five different positions over eleven and one-half inches of space. The illustration at the top shows the stanchion moved forward for a long cow. The second illustration shows the stanchion moved back for a short cow.



The top illustration shows the Star Alignment Device adjusted for long cow bed. The second illustration shows it adjusted for short cow bed.



Every cow in line at the gutter.

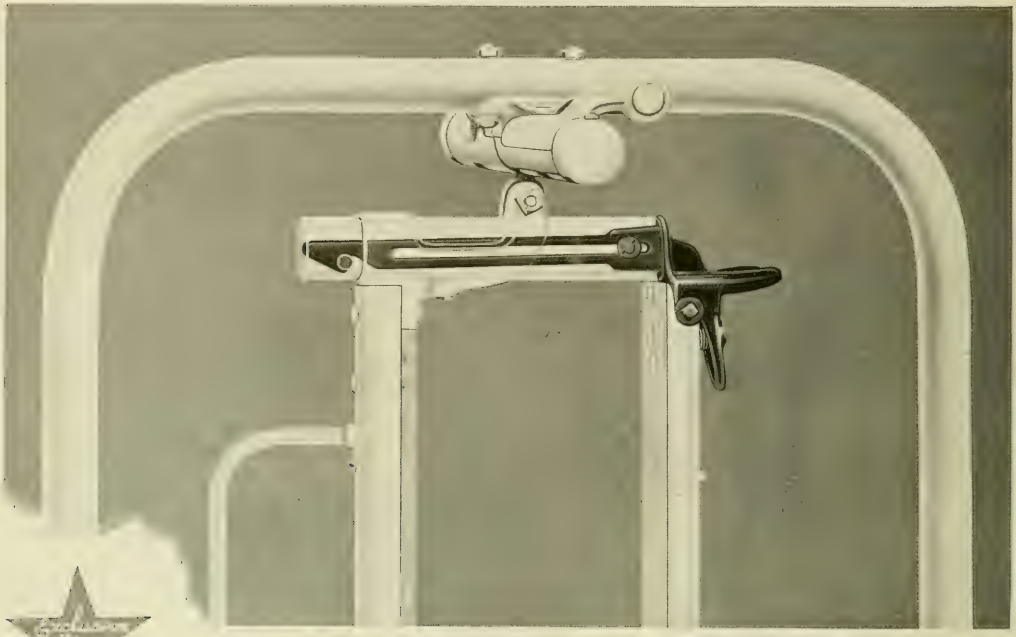


Fig. 510



The Star One-Hand Lock

Three Big Advantages

ONE—The STAR Stanchion is easily opened with one hand. You don't have to set down your pail of milk in order to turn your cow loose. And, when it is open, it is in position to receive the cow when she returns again to the stanchion. The movable bar of the stanchion being equipped with a locking guide, it can be easily closed with one hand.

TWO—The fork or crotch device on the lock straddles the side of the stall arch, which prevents the stanchion from swinging and holds it in place while open.

THREE—The guide of the One-Hand Lock of the STAR Stanchion removes all strain on the hinge, preventing the breaking of the hinge castings. It also insures the perfect operation of the lock even after years of wear.









The Star Stanchion Adjustment

YOU can adjust the width of the STAR Stanchion instantly to fit the neck of a bull or cow, a young heifer or a small calf.

It adjusts in neck width from 5 to 9½ inches by loosening two countersunk set-screws.

This is a feature that means much in saving of time and labor and economy of room.

In the first place, by having the stanchions adjustable, it is not necessary to purchase special equipment for young stock. Even if you do go to the extra expense of having special equipment for your young stock, you can't tell when you buy your equipment how your herd is to be divided as to young and old stock next year.

As long as the stanchions can be instantly adjusted, without taking them out of the stall arches, it is possible to keep your barn properly equipped all the time, and no matter how your herd changes, the stanchions fit.

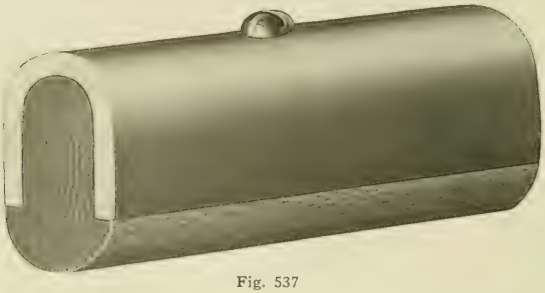
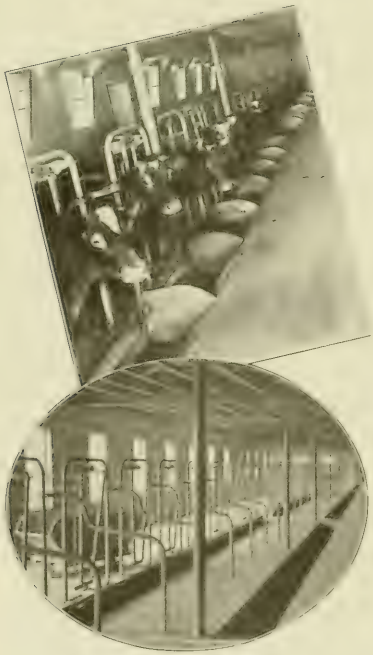


Fig. 537

The Star Wood Lining

"A Big Little Thing"



THE STAR Stanchion has a wood lining which is there for keeps. It is fastened as securely to the metal as if it had grown there. Nothing much less than blasting powder will tear it off.

Wood linings are necessary to the comfort of the animals.

But MOST wood linings are not permanent. They are held only by short screws and are easily crowded off.

Not so with the Wood Lining of STAR Stanchions. It is not merely "hung on" with screws, but is FORCED into the U-bar—wedged in—and cannot possibly be loosened by the cattle.

In addition to that we have made it EXTRA safe by an added anchor of screws FROM the BACK, which go one and a quarter inches into the kiln-dried, hard maple of which it is made.

You'll never have the petty annoyance and expense of replacing wood linings if you buy the STAR Stanchion.



Fig. 511

The Star Double Chain Hanging

ANOTHER exclusive feature that means STAR leadership. The double chain on STAR Stanchions is practically noiseless—no rattling or clanking to disturb the peace and comfort of the cows.

The chain may be made as loose or as tight as you wish, thus giving the cow the desired amount of freedom.

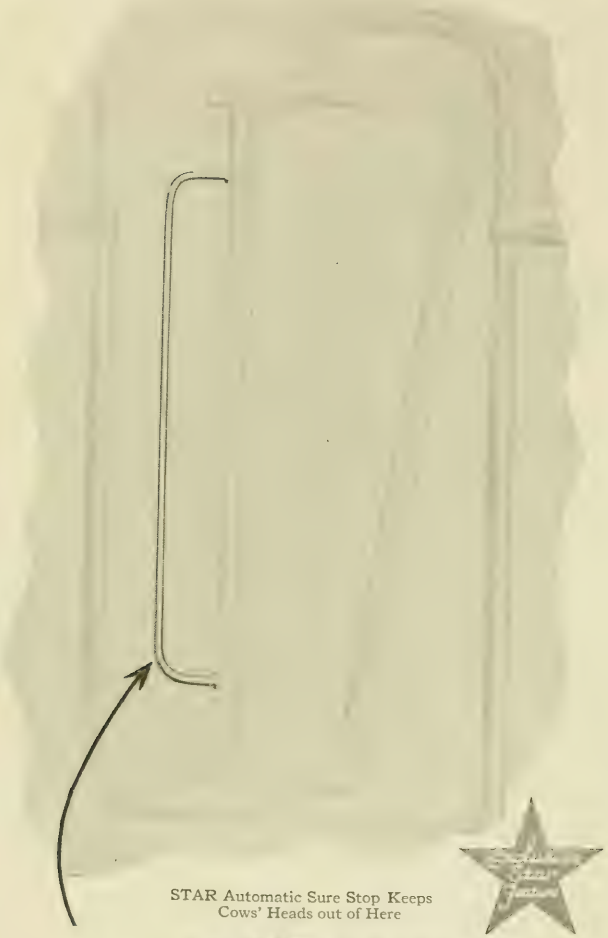
All the "play" is backward and forward. This enables the cow to get up without inconvenience and without bruising her shoulders.

There is no "play" from side to side. The cows are prevented from reaching over and stealing each other's feed.

This manner of hanging stanchions saves the need of cut-outs in the curb. The stanchion hangs low enough for comfort without the curb being cut out. These cut-outs are not only expensive to make but allow the cow to work feed back into the stall and waste it. A level curb prevents the waste of feed. Feed costs money. You can't afford to let cows waste it.

The fact that there are no connections between the stanchion and the curb means that you will never be obliged to tear out any concrete work to make any replacements—there are no anchors to set, no bolts to place, no threads to strip. If you have ever torn out any concrete work, you will know what this saving means.





STAR Automatic Sure Stop Keeps Cows' Heads out of Here



The Star Automatic Sure Stop

THIS is a simple device, but it saves lots of time and work.

Did you ever see a cow that wouldn't put her head in the wrong place if she could? That seems to be her nature. It is very annoying to have a cow poke her head in beside the stanchion and have to back her up before you can stanchion her. It wastes time, too.

When a cow enters a STAR Stall with the stanchion open, there is only one place where she can put her head and that is right into the Stanchion.

There is no other place for it.

The STAR Automatic Sure Stop keeps her head from going in on one side. The locked fork keeps her head from going in the other.

This device is a simple bowed steel bar attached to the side of the stanchion.

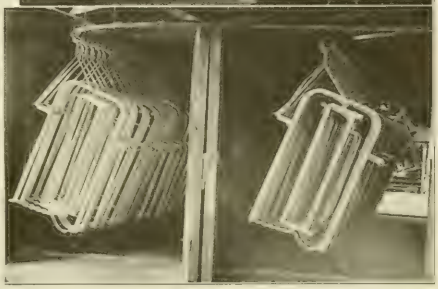
It swings with the stanchion, so that it in no way interferes with the freedom of the cow.

It is always in place, but never in the way. It never needs attention and saves valuable time when the herd enters the barn.









How We Get That Permanent Finish on Star Equipment

A PERMANENT finish can be secured only when applied to a clean surface. All material used in STAR EQUIPMENT is given a chemical bath, which removes mill scale, and insures a perfectly clean, smooth surface for the enamel.

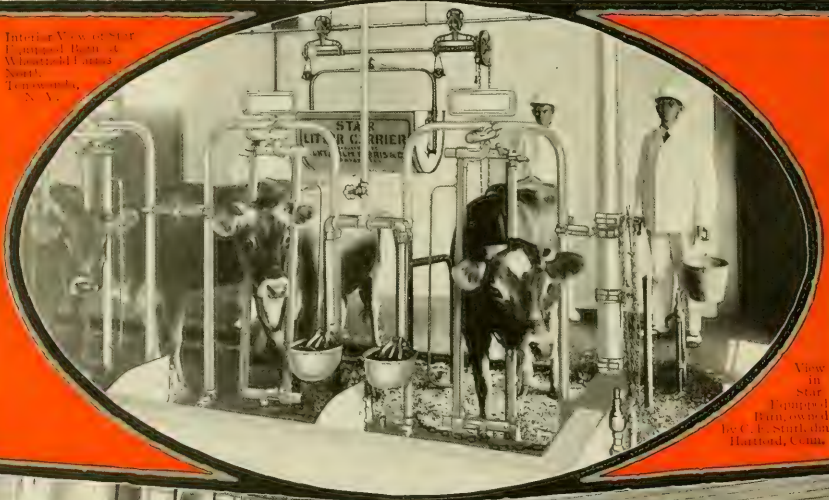
A permanent finish applied on steel must be of exceptional quality to withstand the variation in temperature in the dairy barn. It must have elasticity to absorb the expansion and contraction of the steel.

The special gray enamel on STAR EQUIPMENT was selected after long experimenting, to get the most attractive and lasting appearance, and embody necessary qualities to resist rust and to withstand the ammonia and gases in the barn.

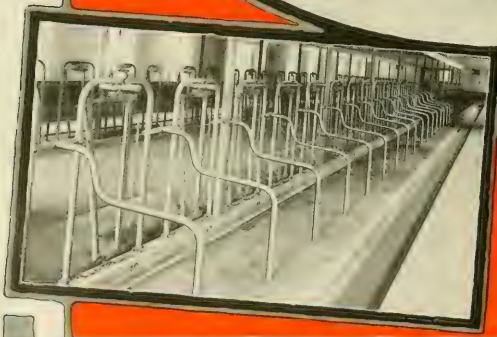
To insure an even coat and smooth finish, the completed piece is dipped into the enamel. After being dipped, it is conveyed to ovens where the enamel is thoroughly baked on. The care and thought given to STAR finish, assures an even color and an even, permanent finish.



Interior View of Star Equipped Barn at Wheatsfield Farms Stock, Tarrytown, N. Y.



View in Star Equipped Barn, owned by C. E. Smith, dairy Hartford, Conn.



Star Equipped Barn on Clark Estate, Cooperstown, N. Y.



View of Pen Department in Star Equipped Barn, owned by J. C. Dold, Buffalo, N. Y.



Interior of STAR Equipped Barn, Owned by
H. J. Krebs, Wilmington, Del.

STAR

Barn Equipment

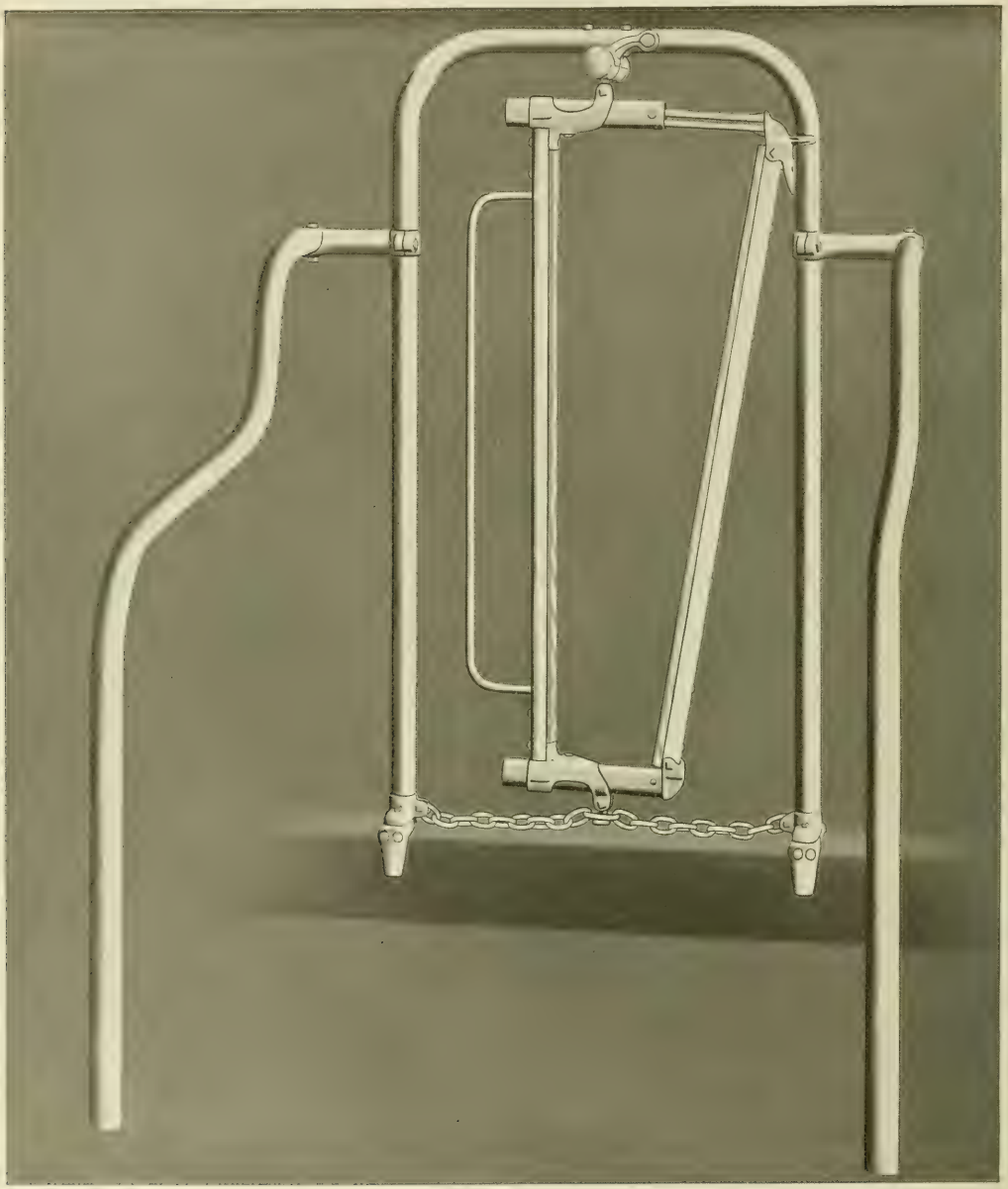


Fig. 521

No. 10 STAR STEEL STALL

(Equipped with Giant STAR Stanchion, Automatic Sure Stop, STAR Alignment Device and STAR Curb Clamps)

No. 10 Star Steel Stall

(Unit System)

Equipped with Giant STAR Stanchion, Automatic Sure Stop, STAR Alignment Device and STAR Curb Clamps

SPECIFICATIONS

ARCH — STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms —regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS — STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION — Giant STAR Stanchion No. 486; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock-open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1¼ in. x 1¼ in. x 3/16 in., completely filled with kiln dried hard maple linings driven in and secured by 1¼ in. drive screws (Page 16).

SURE STOP — STAR Automatic; made from ½ in. bowed steel; permanently secured to stanchion upright; operates automatically with stanchion (Page 18).

ALIGNMENT DEVICE — STAR Alignment Device; patented; instantly adjustable; built entirely of steel and best grade malleable iron; provides for extreme adjustment of 11½ in. (Page 12).

CURB CLAMPS — STAR Curb Clamps; patented; built of best grade malleable iron; jaws connected by ⅜ in. x 7¾ in. draw bolts (Page 11).

FINISH — After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

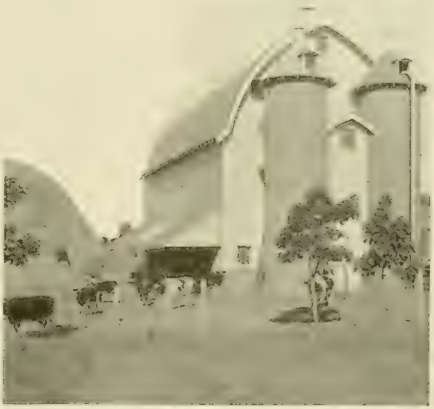
WEIGHT — Average weight per stall, 80 lbs. Weight of Extra Stall Partitions, 13½ lbs.

MANGER PATTERN — Furnished free upon request; made of hard wood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

STAR Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added to the No. 10 STAR Steel Stall at any time desired.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn, owned by Oliver P. Ensley, Indianapolis, Ind.

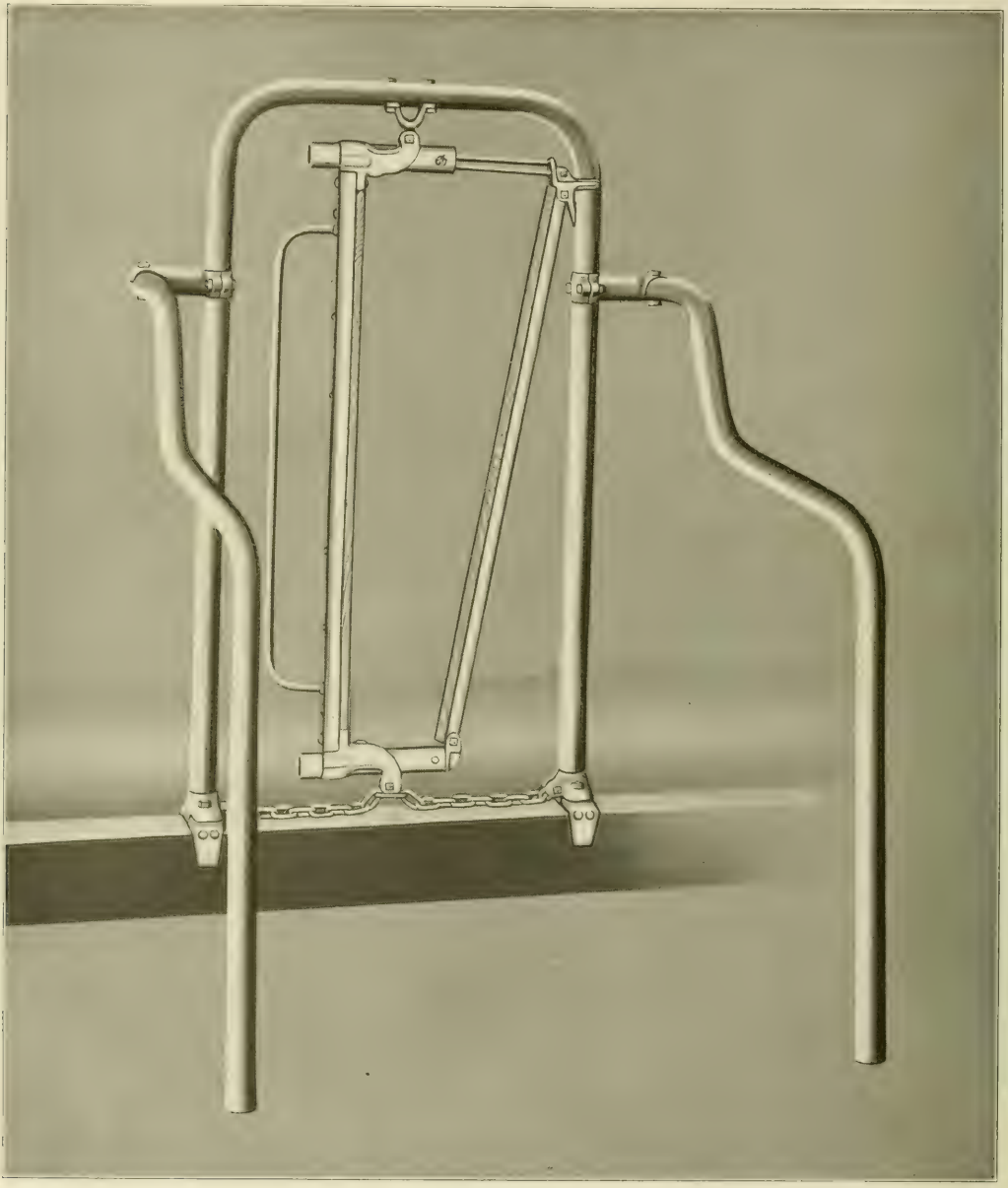


Fig. 517

No. 11 STAR STEEL STALL

(Equipped with Giant STAR Stanchion, Automatic Sure Stop, and STAR Curb Clamps)

No. 11 Star Steel Stall

(Unit System)

Equipped with Giant STAR Stanchion, Automatic Sure Stop and STAR Curb Clamps

SPECIFICATIONS

ARCH — STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms—regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS — STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION — Giant STAR Stanchion No. 486; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock-open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1¼ in. x 1¼ in. x ⅜ in., completely filled with kiln-dried hard maple linings driven in and secured by 1¼ in. drive screws (Page 16).

SURE STOP — STAR Automatic; made from ½ in. bowed steel; permanently secured to stanchion upright; operates automatically with stanchion (Page 18).

CURB CLAMPS — STAR Curb Clamps; patented; built of best grade malleable iron; jaws connected by ⅜ in. x 7¾ in. draw bolts (Page 11).

FINISH — After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT — Average weight per stall, 75 lbs. Weight of extra stall partitions, 13½ lbs.

MANGER PATTERN — Furnished free upon request; made of hard wood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added to the No. 11 STAR Steel Stall at any time desired.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



Prize-winning Jerseys, owned by A. V. Barnes, New Canaan, Conn.
(See interior of his barn in the illustrated section).

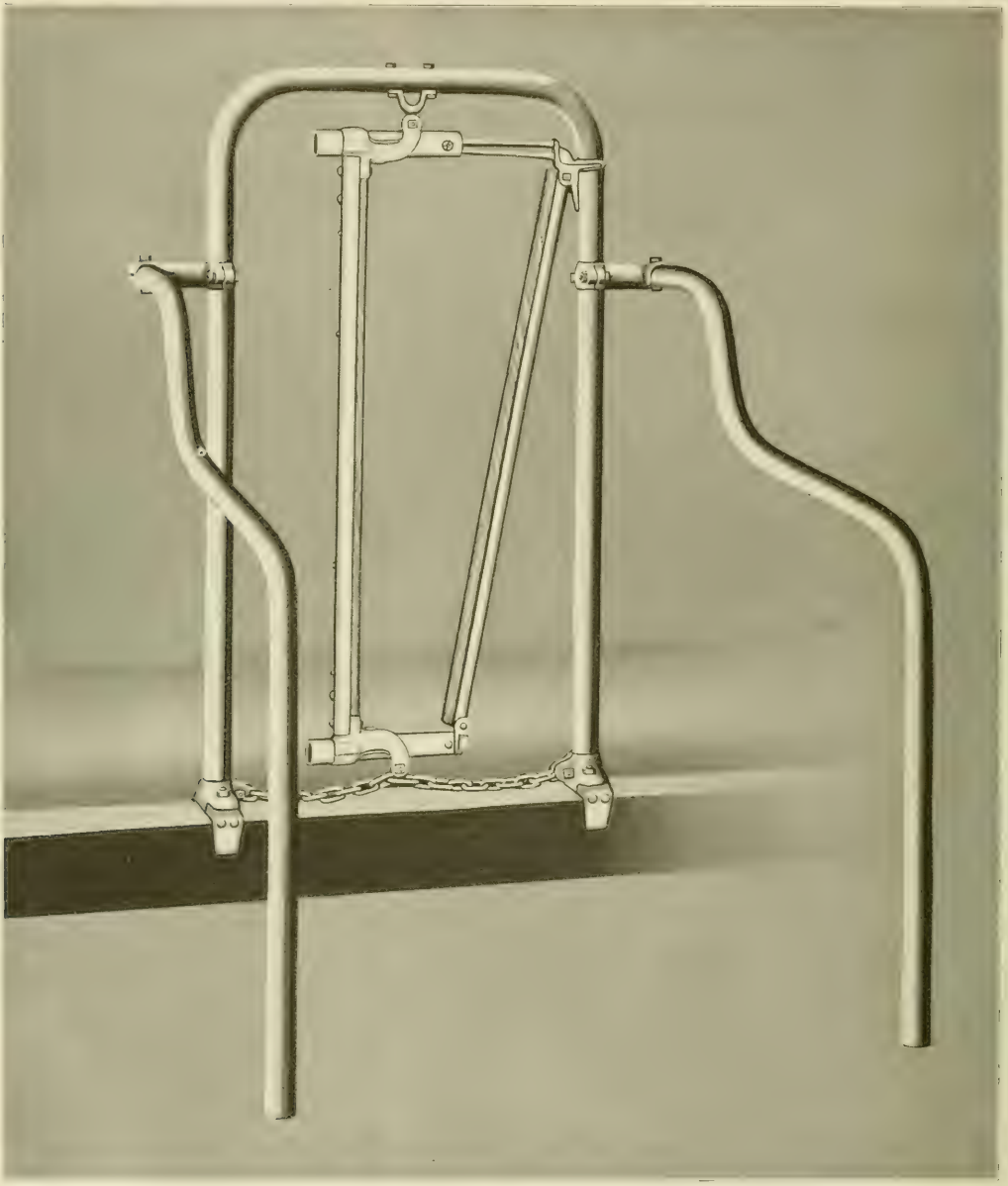


Fig. 851

No. 12 STAR STEEL STALL

(Equipped with Giant STAR Stanchion and STAR Curb Clamps)

No. 12 Star Steel Stall

(Unit System)

Equipped with Giant STAR Stanchion and STAR Curb Clamps

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms—regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION Giant STAR Stanchion No. 486; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock-open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1¼ in. x 1¼ in. x 3/16 in., completely filled with kiln-dried hard maple linings driven in and secured by 1¼ in. drive screws (Page 16).

CURB CLAMPS STAR Curb Clamps; patented; built of best grade malleable iron; jaws connected by ⅜ in. x 7¾ in. draw bolts (Page 11).

FINISH After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 72 lbs. Weight of extra stall partitions, 13½ lbs.

MANGER PATTERN Furnished free upon request; made of hardwood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

The No. 12 STAR Steel Stall can be supplied with STAR Automatic Sure Stop, if desired. STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added at any time.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn, owned by
E. W. Wing, Elgin, Ill.

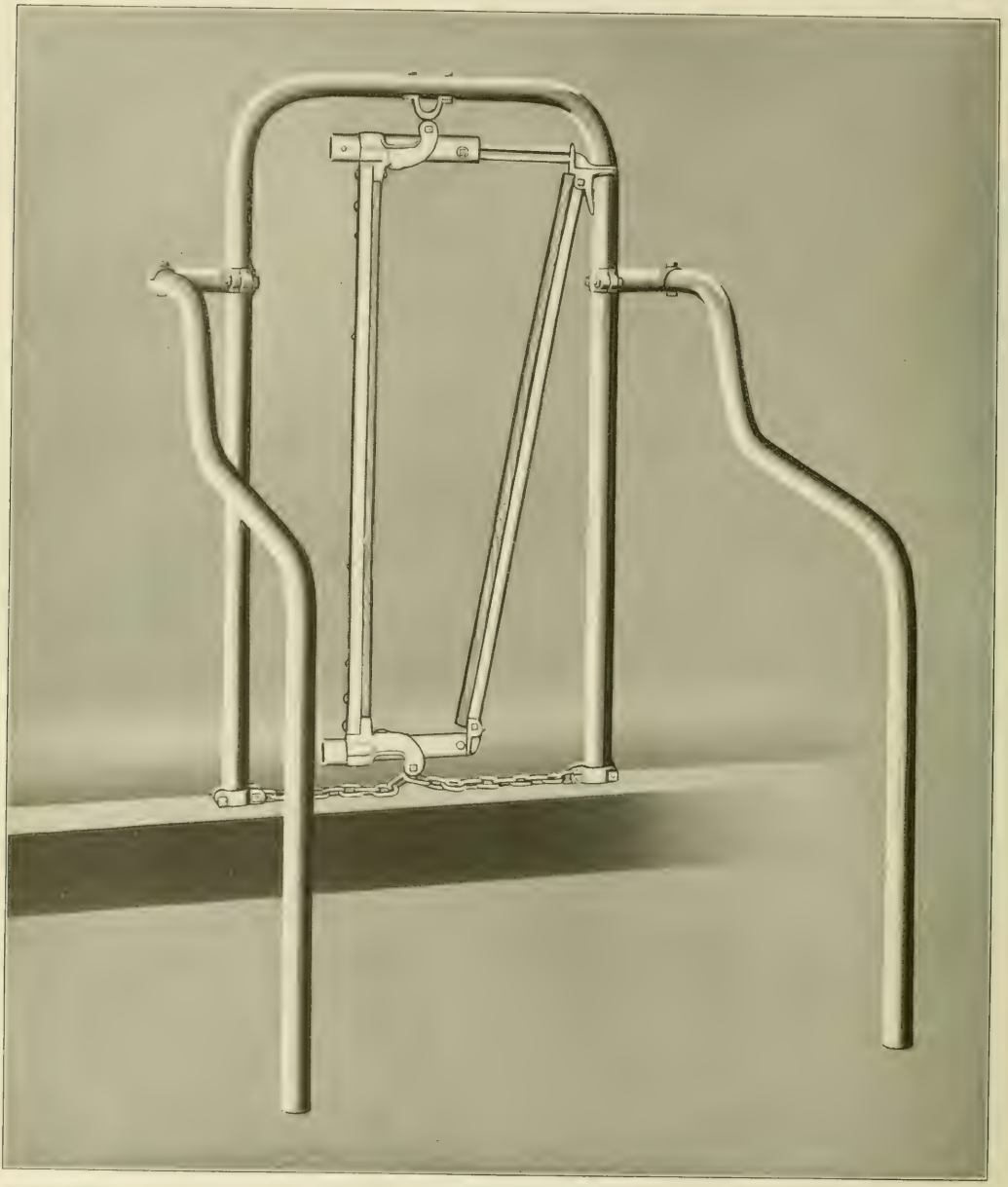


Fig. 852
No. 13 STAR STEEL STALL
(Equipped with Giant STAR Stanchion)

No. 13 Star Steel Stall

(Unit System)

Equipped with Giant STAR Stanchion

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms—regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION Giant STAR Stanchion No. 486; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock-open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1¼ in. x 1¼ in. x 3/16 in., completely filled with kiln-dried hard maple linings driven in and secured by 1¼ in. drive screws (Page 16).

FINISH After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 70 lbs. Weight of extra stall partitions, 13½ lbs.

MANGER PATTERN Furnished free upon request; made of hard wood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

The No. 13 STAR Steel Stall can be supplied with STAR Automatic Sure Stop or Curb Clamps, if desired. STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added at any time.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn, owned by W. B. Gallemore, Seymour, Ind.



Fig. 853

No. 14 STAR STEEL STALL

(Equipped with No. 434W STAR Adjustable Steel Stanchion with wood linings)

No. 14 Star Steel Stall

(Unit System)

Equipped with No. 434W STAR Adjustable Steel Stanchion with wood linings

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms—regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64).

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION STAR Stanchion No. 434W; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1⅝ in. x ⅞ in. x ¼ in., completely filled with kiln-dried, hard maple linings driven in and secured by 1 in. drive screws (Page 16).

FINISH After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 68 lbs. Weight of Extra Stall Partitions, 13½ lbs.

MANGER PATTERN Furnished free upon request; made of hardwood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case, specify special pattern No. 2.

SPECIAL NOTE

The No. 14 STAR Steel Stall can be supplied with STAR Automatic Sure Stop or Curb Clamps, if desired. STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls or Name Plates can be added at any time.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn, Cedar Lake Farm, Mikana, Wis.



Fig. 854

No. 15 STAR STEEL STALL

(Equipped with No. 434 STAR Adjustable Steel Stanchion)

No. 15 Star Steel Stall

(Unit System)

Equipped with No. 434 STAR Steel Stanchion

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms —regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION STAR Stanchion No. 434; patented; adjustable in neck space from 5 in. to 9½ in (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock open device; protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1⅝ x ⅞ x ¼ in.

FINISH After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 65 lbs. Weight of Extra Stall Partitions, 13½ lbs.

MANGER PATTERN Furnished free upon request; made of hardwood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

The No. 15 STAR Steel Stall can be supplied with STAR Automatic Sure Stop or Curb Clamps if desired. STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls or Name Plates can be added at any time.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn on Willow Brook Farm, North Pembroke, Mass.

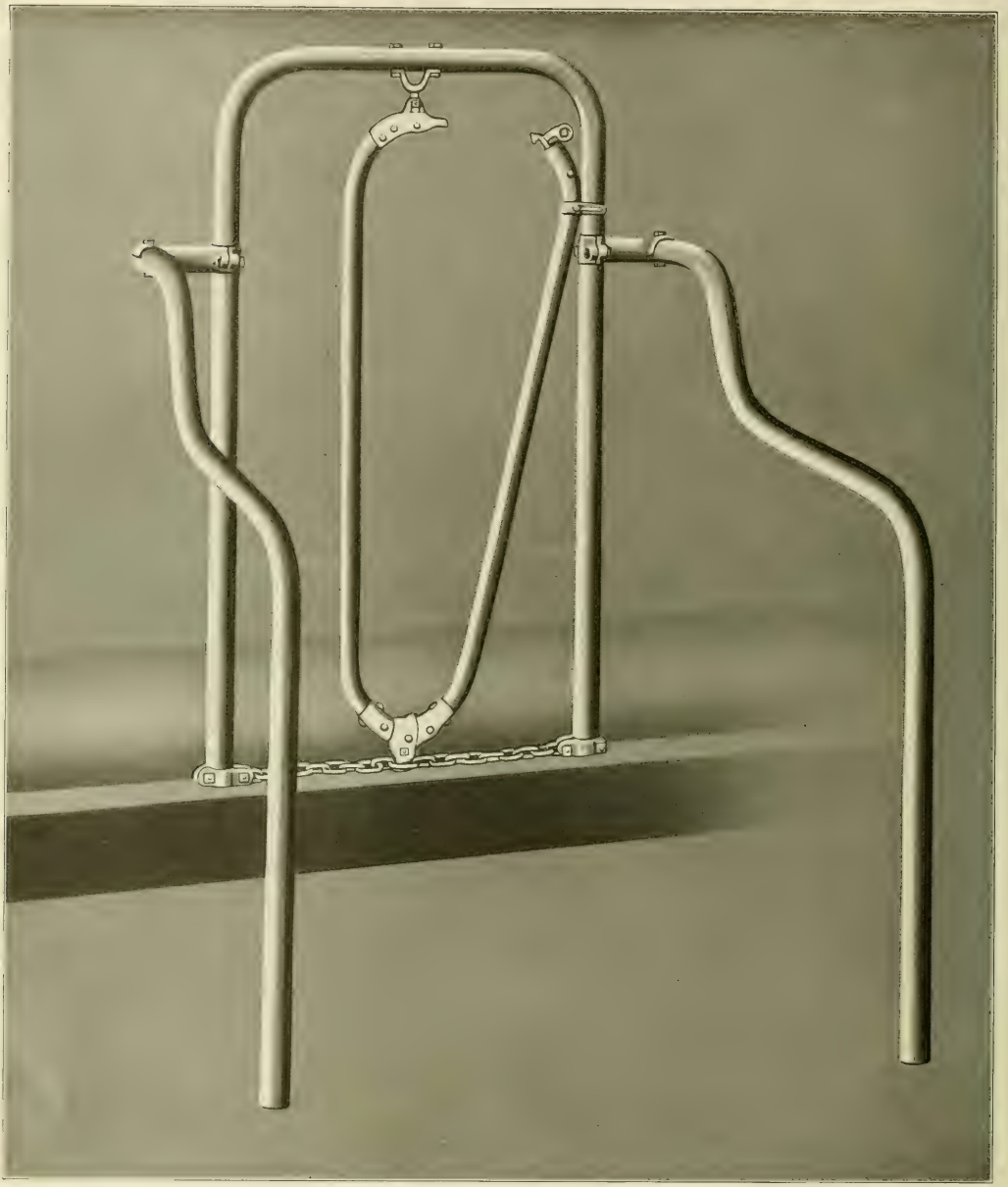


Fig. 855
No. 16 STAR STEEL STALL
(Equipped with No. 999 STAR Tubular Steel Stanchion)

No. 16 Star Steel Stall

(Unit System)

Equipped with No. 999 STAR Tubular Steel Stanchion

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe $1\frac{5}{8}$ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms—regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe $1\frac{5}{8}$ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION STAR Stanchion No. 999; patented; neck space of standard width; one-hand, cow-proof lock; lock open device; hinge at bottom extra heavy, made of steel with patented device preventing stanchion from opening only to necessary width; swivel hanging at top and double chain hanging at bottom. Uprights made from $1\frac{5}{16}$ in. pipe—new and tested (Page 48).

FINISH After all machine work has been done on the material entering into the construction of this stall the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 62 lbs. Weight of Extra Stall Partitions, $13\frac{1}{2}$ lbs.

MANGER PATTERN Furnished free upon request; made of hardwood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

The No. 16 STAR Steel Stall can be supplied with STAR Curb Clamps, if desired. STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added at any time.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Walworth County Dairy Barn
Elkhorn, Wis.

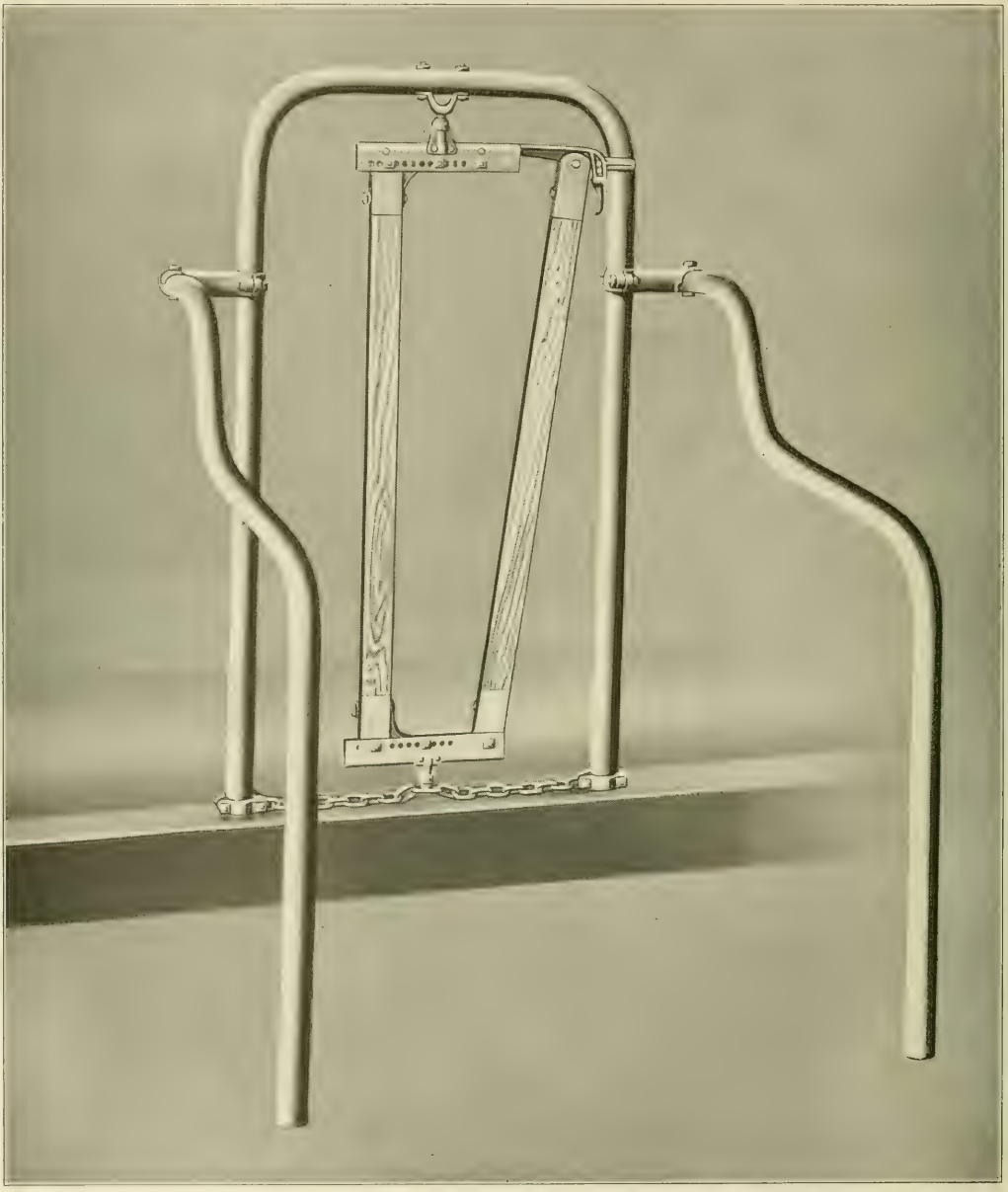


Fig. 856

No. 17 STAR STEEL STALL

(Equipped with No. 452 STAR Adjustable Wood Stanchion)

No. 17 Star Steel Stall

(Unit System)

Equipped with No. 452 STAR Adjustable Wood Stanchion

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms —regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION STAR Stanchion No. 452; patented; adjustable in neck space from 4½ in. to 8½ in.; one-hand, cow-proof lock; malleable guide removes strain from hinge; lock-open device; protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights made of 1¼ in. x 2½ in. seasoned hardwood—strong and durable; cross pieces made of high grade steel, securely bolted and held in place by malleable iron braces (Page 50).

FINISH After all machine work has been done on the material entering into the construction of this stall the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 58 lbs. Weight of Extra Stall Partitions, 13½ lbs.

MANGER PATTERN Furnished free upon request; made of hardwood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

The No. 17 STAR Steel Stall can be supplied with STAR Curb Clamps, if desired. STAR Alignment Device, Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added at any time.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn, owned by Leslie Thompson Woodstock, Ill.

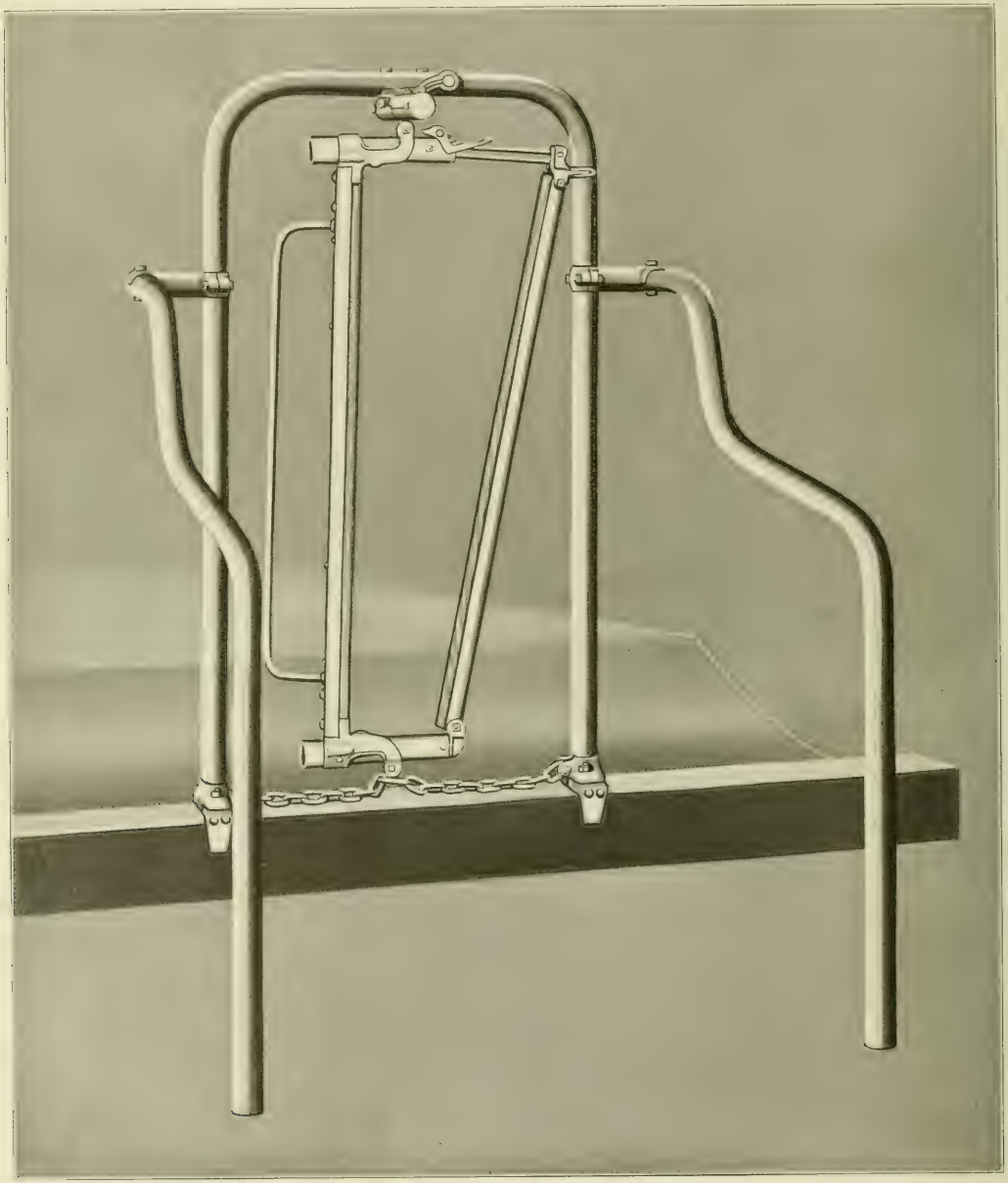


Fig. 857

No. 18 STAR STEEL STALL

(Equipped with No. 495 Boss STAR Stanchion, Automatic Sure Stop, STAR Alignment Device and STAR Curb Clamps)

No. 18 Star Steel Stall

(Unit System)

Equipped with No. 495 Boss STAR Stanchion, Automatic Sure Stop, STAR Alignment Device and STAR Curb Clamps

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms—regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. widths furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION Boss STAR Stanchion No. 495; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand cow-proof lock; malleable guide removes strain from hinge; lock-open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1¼ x 1¼ x 3/16 in., completely filled with kiln dried hard maple linings driven in and secured by 1¼ in. drive screws (Page 16).

SURE STOP STAR Automatic; made from ½ in. bowed steel; permanently secured to stanchion upright; operates automatically with stanchion (Page 18).

ALIGNMENT DEVICE STAR Alignment Device; patented; instantly adjustable; built entirely of steel and best grade malleable iron; provides for extreme adjustment of 11½ in. (Page 12).

CURB CLAMPS STAR Curb Clamps; patented; built of best grade malleable iron; jaws connected by ⅜ in. x 7¾ in. draw bolts (Page 11).

FINISH After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 80 lbs. Weight of Extra Stall Partitions, 13½ lbs.

MANGER PATTERN Furnished free upon request; made of hardwood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

STAR Self-cleaning Mangers, Manger Partitions, Water Bowls, or Name Plates can be added to the No. 18 STAR Steel Stall at any time desired.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn, owned by J. C. Dold
Buffalo, N. Y.

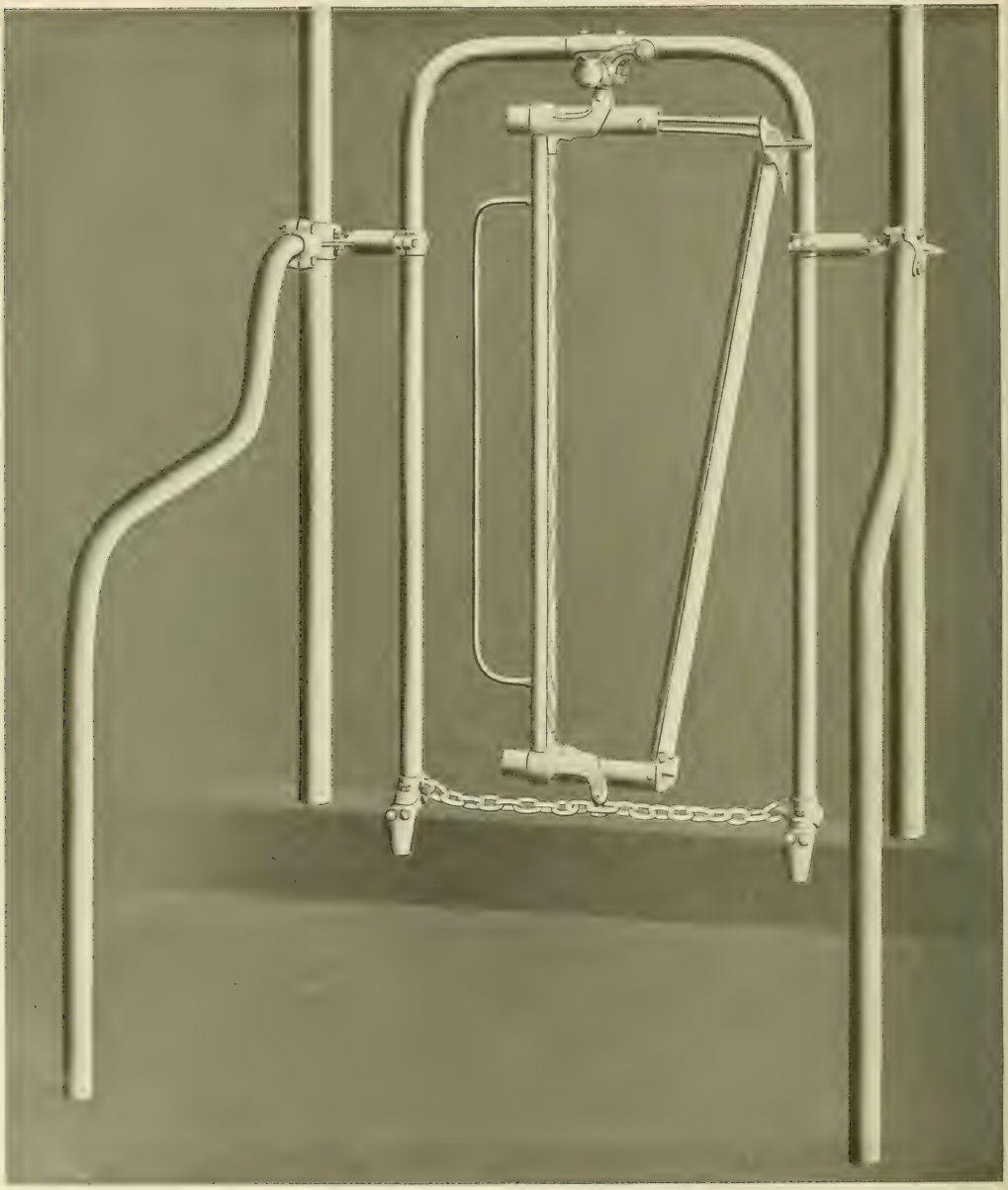


Fig. 525

No. 20 STAR STEEL STALL

Equipped with Giant STAR Stanchion, Automatic Sure Stop, STAR Alignment Device and STAR Curb Clamps)

No. 20 Star Steel Stall

(Unit System)

Equipped with Giant STAR Stanchion, Automatic Sure Stop, STAR Alignment Device and STAR Curb Clamps

SPECIFICATIONS

ARCH STAR "Unit System;" patented; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in. (Page 10). Adapted to any width stall by using longer or shorter stall arms —regular widths, 3 ft., 3 ft. 3 in., 3 ft. 6 in.; 3 ft. 6 in. width furnished unless otherwise specified. Stall Arms illustrated Page 64.

PARTITIONS STAR Triple Bend Stall Partitions; made of high grade pipe 1⅝ in. outside diameter—new and tested. Thickness of pipe wall, .14 in.

STANCHION Giant STAR Stanchion No. 486; patented; adjustable in neck space from 5 in. to 9½ in. (Page 15); one-hand, cow-proof lock; malleable guide removes strain from hinge; lock-open device (Page 14); protected hinge; swivel hanging at top and double chain hanging at bottom (Page 17). Uprights are high carbon steel U-bars, 1¼x1¼x$^{3}/_{16}$ in.; completely filled with kiln dried hard maple linings driven in and secured by 1¼ in. drive screws (Page 16).

SURE STOP STAR Automatic; made from ½ in. bowed steel; permanently secured to stanchion upright; operates automatically with stanchion (Page 18).

ALIGNMENT DEVICE STAR Alignment Device; patented; instantly adjustable; built entirely of steel and best grade malleable iron; provides for extreme adjustment of 11½ in. (Page 12).

CURB CLAMPS STAR Curb Clamps; patented; built of best grade malleable iron; jaws connected by ⅜ in. x 7¾ in. draw bolts (Page 11).

FINISH After all machine work has been done on the material entering into the construction of this stall, the mill scale, grease, or other foreign matter is thoroughly removed by a special cleaning process, or acid bath. It provides a thoroughly clean surface for the rust and ammonia resisting gray enamel, which is then applied and baked on permanently (Page 19).

WEIGHT Average weight per stall, 88 lbs. Weight of Extra Stall Partitions, 13½ lbs.

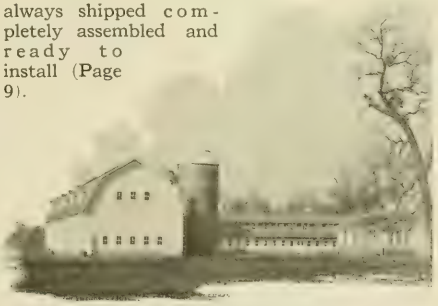
MANGER PATTERN Furnished free upon request; made of hard wood; to be used as pattern for shaping concrete mangers. Specify pattern No. 1 where No. 515 STAR Manger Partitions are to be used and in every instance except where No. 524 STAR Self-cleaning Mangers are to be used, in which case specify special pattern No. 2.

SPECIAL NOTE

Star Self-cleaning Mangers, Manger Partitions, Water Bowls or Name Plates can be added to the No. 20 STAR Steel Stall at any time desired.

The No. 20 STAR Steel Stall is equipped the same as the No. 10 STAR Steel Stall, but is built to conform to any arrangement or size of steel posts or pipe columns placed in stall row, as shown in illustration on page 40. Any of the STAR Steel Stalls numbers 10 to 18, inclusive, can be built in this manner. For STAR Steel Supporting Columns, see Page 68.

STAR Stalls always shipped completely assembled and ready to install (Page 9).



STAR Equipped Barn on London Prison Farm
London, Ohio

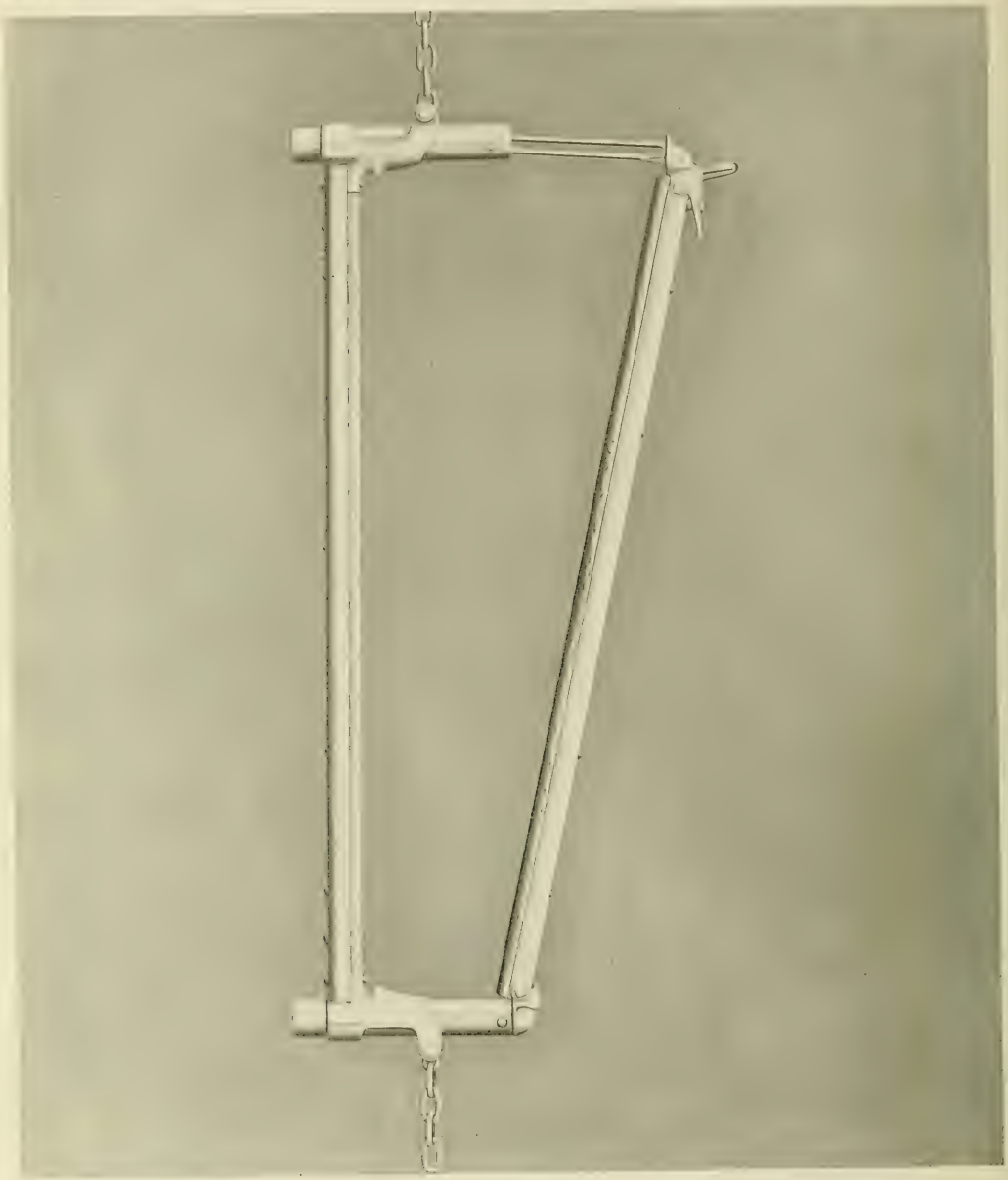


Fig. 486
GIANT STAR ADJUSTABLE STEEL STANCHION

No. 486 Giant Star Adjustable Steel Stanchion

HERE is the biggest selling stanchion in the world.

And its huge sales are based on merit.

Time tried and proven worthy, it is now the standard toward which all other manufacturers are striving.

When our basic patents expire, they may duplicate the Giant Star—certainly not before.

It is easily and quickly adjustable in neck width to fit the largest bull or the smallest calf. And the adjustment is firm and secure.

No other stanchion made is as strong and heavy as the Giant Star—comparison will prove this.

It is equipped with a one-hand lock so you don't have to set down your pail of milk to turn the cow loose.

And, automatically, it drops into position to receive the cow on her return to the stall.

The sliding guide of the Giant Star Stanchion removes all strain on the hinge and insures perfect operation of the lock at all times.

The wood lining is wedged into the U-bar—secured as tightly as if it were part of the metal—then additionally anchored with inch and a quarter screws. This wood lining is made of seasoned hard maple, thoroughly kiln-dried, and is the only wood lining that the cattle can not crowd off.



Fig. 537

Cross section of Giant Star Stanchion, showing wood lining. This lining is made of thoroughly kiln-dried hard maple, forced in under pressure, and then secured by long screws. It cannot be loosened

The Giant Star costs but little more and offers so *much* more satisfaction and wear that it is by far the *cheapest in the long run.*

Finished in gray enamel, thoroughly baked on.

No. 486 Giant Star Stanchion hung with chains top and bottom, weight each, 25 pounds. Hung with swivel at top and double chain hanging at bottom, weight each, 27 pounds.



STAR Equipped Barn, owned by Salvation Army, Mentor, Ohio

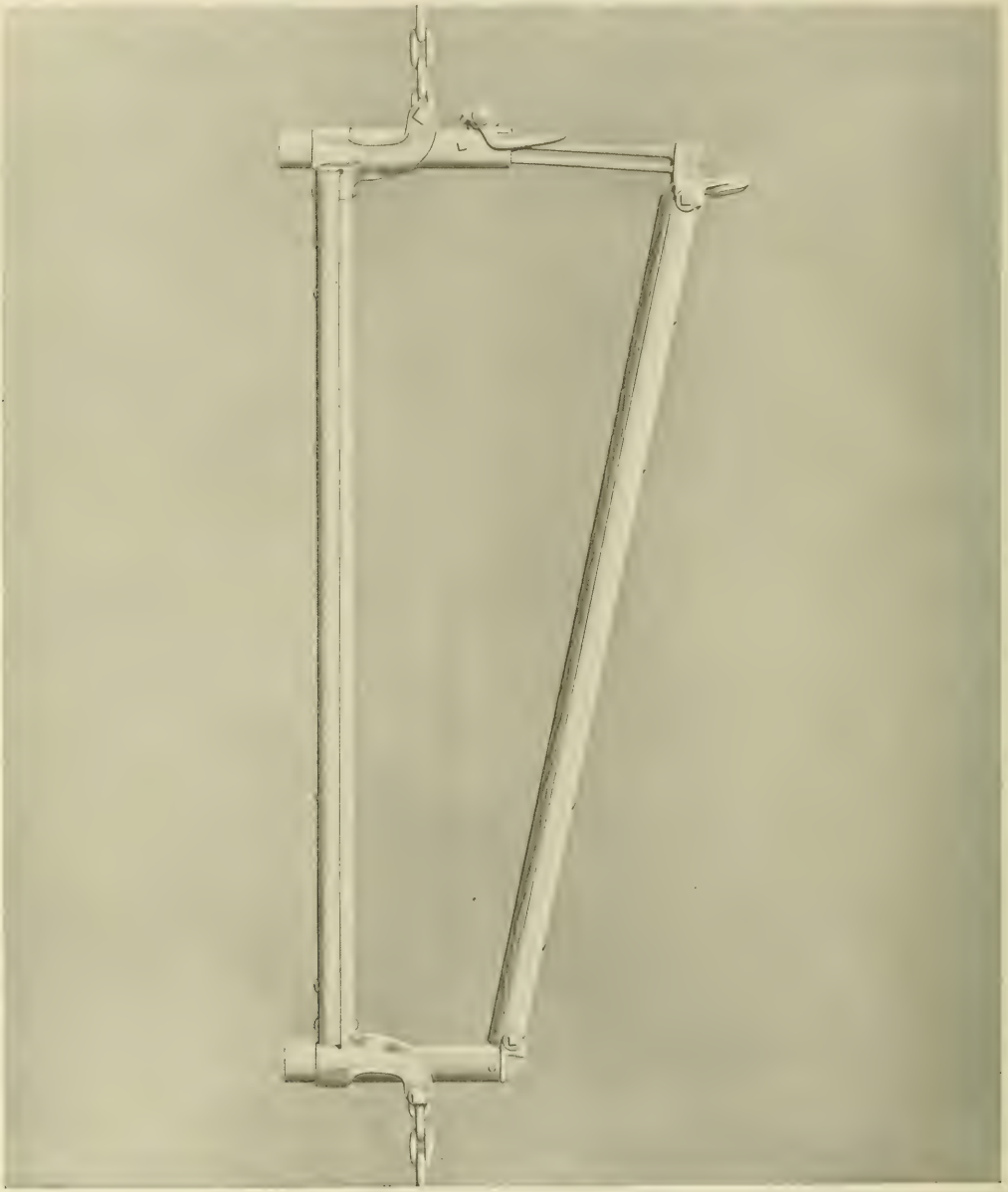


Fig. 495

BOSS STAR ADJUSTABLE STEEL STANCHION

No. 495 Boss Star Adjustable Steel Stanchion

THE Boss STAR Adjustable Steel Stanchion shown on the opposite page combines cow comfort and security in the highest degree.

With this stanchion there will never be any need of squeezing large cows into stanchions which are too narrow for them, and never any occasion to rip off the wood lining of the stanchion to give a large cow the necessary neck space and comfort. It is instantly adjustable in neck width from five and one-half to nine and one-half inches.

This adjustment in neck width is quickly and easily made. Simply loosen two set screws and narrow or widen the stanchion as you please.

The wood lining of this stanchion is so applied that it cannot possibly be loosened. The lining is carefully shaped and fitted into the U-bar; it is wedged in place. Moreover, it is fastened by screws which stick into the wood an inch and a quarter.

The face of this lining is rounded the same shape as the inner edge of a stanchion on which the cows have been rubbing for years. The Boss STAR Stanchion is just as comfortable the first time the cow puts her head through as it is after years of use.

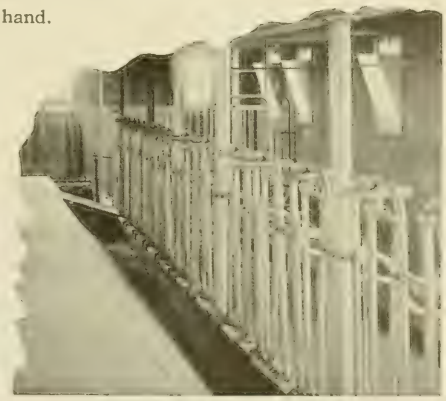
The upper end of the movable upright of the Boss STAR Stanchion is fitted with a guide. This guide relieves the strain on the hinge. It slides back and forth in the tube which forms the top of the stanchion so that the lock can't miss when the stanchion is slammed shut.

A malleable loop forms the latch. This drops over a catch on the movable upright and securely locks the stanchion. The loop or latch is so protected that it cannot be raised by cattle. The spring which holds it in place is made of best quality spring steel, tempered in oil, especially constructed to stand continuous torsion strain without weakening. The Boss Stanchion Lock is absolutely cow proof, yet it can be easily opened or closed with one hand.

The upper end of the movable upright is fitted with a crotch device which sets astride the stall frame when the stanchion is open. This prevents the stanchion from swinging.

Finished in gray enamel, thoroughly baked on.

No. 495 Boss STAR Adjustable Steel Stanchion, hung chain top and bottom; weight each, 25½ pounds. Hung with swivel at top and double chain hanging at bottom, weight each, 27 pounds.



STAR Equipped Barn, owned by Oliver P. Ensley Indianapolis, Ind.

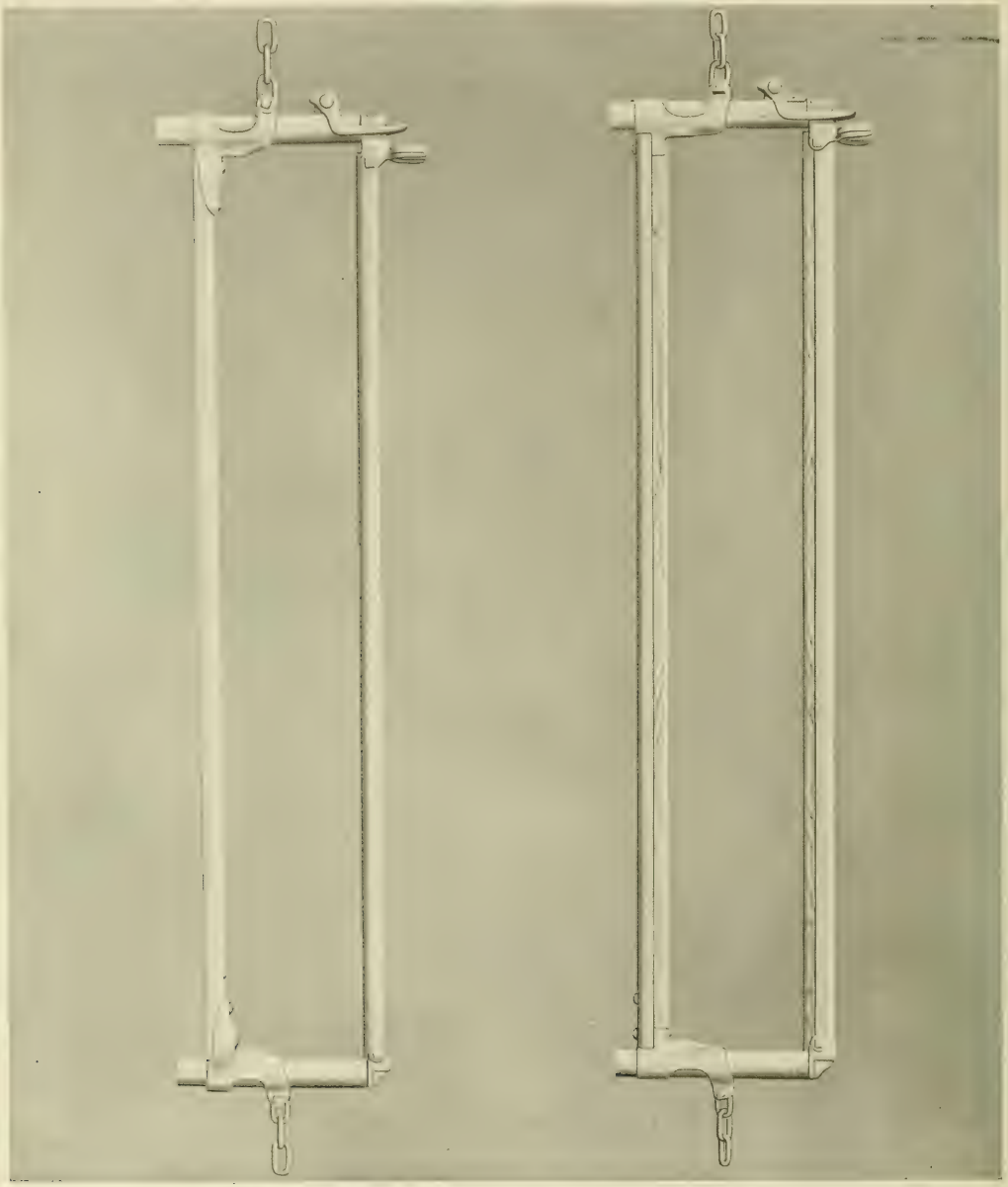


Fig. 434
WITHOUT Wood Lining

Fig. 434W
WITH Wood Lining

STAR ADJUSTABLE STEEL STANCHION

Nos. 434 and 434W
Star Adjustable Steel Stanchions

THE Star Adjustable Steel Stanchion is constructed of special high carbon U-bar steel, with malleable fittings throughout and with or without Star wood linings. It is built to supply the demand for an adjustable stanchion, with wood lining, if desired, at a moderate cost.

It is neat in appearance, light and easy to operate, but at the same time strong enough to secure any dairy cow.

The lock, or latch is a strong feature of this stanchion. It is identical with that used on the Boss Stanchion, shown on page 44.

This stanchion is fitted with a guide which slides in the upper cross-bar. When the stanchion is open the movable upright is always guided, and when closed it is locked by the malleable loop which drops over the guide.

The lock is so protected that it cannot be opened by animals, but can be released by the operator with one hand. The stanchions can be closed by simply shoving them shut, and you can turn the cow loose without stopping to set down your pail of milk.

The stanchion is fitted with a yoke or crotch device, which straddles the side of the stall frame and holds the stanchion in place when open.

Just by loosening two set-screws, one holding the upper cross-bar and the other holding the lower cross-bar, this stanchion can be instantly adjusted in neck width from 5 to 9½ inches, so that the same stanchion can be used to accommodate a calf, or cow, as desired.

Finished in gray enamel, thoroughly baked on.

No. 434W Star Adjustable Steel Stanchion, wood lined, weight each, 23½ pounds. Furnished either chain or swivel hung.

No. 434 Star Adjustable Steel Stanchion, without wood lining, weight each, 21 pounds. Furnished either chain or swivel hung.



STAR Equipped Barn, on Haldaway Dairy Farm, Provo, Utah

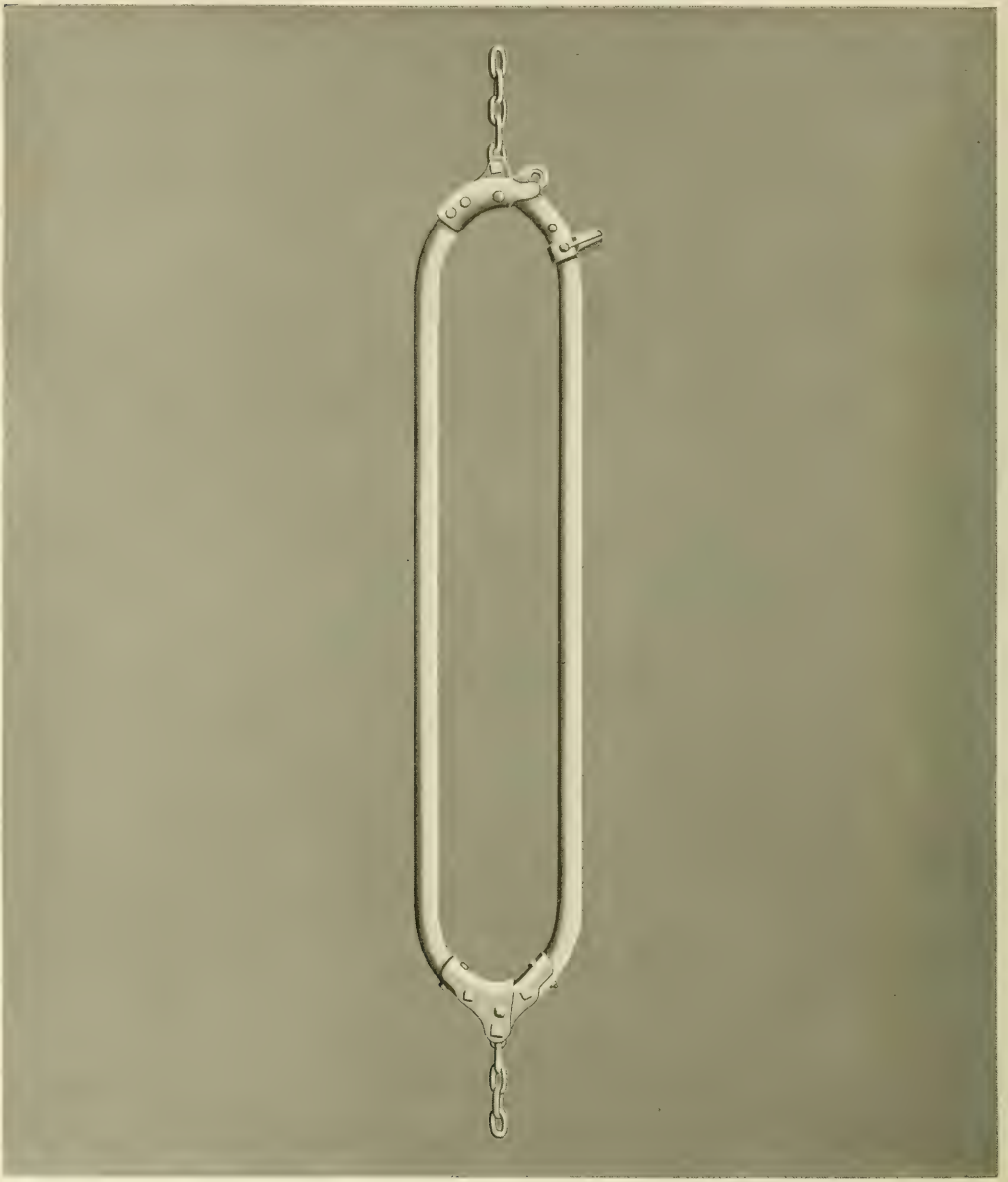


Fig. 999
STAR TUBULAR STEEL STANCHION

No. 999 Star Tubular Steel Stanchion

THE No. 999 STAR Tubular Steel Stanchion, illustrated on the opposite page, meets with instant favor where a sanitary steel stanchion at a moderate price is desired. This stanchion is constructed of 1 5-16 inch outside diameter high grade, tested steel pipe. It is the strongest and most satisfactory stanchion of this type on the market. In this stanchion is combined simplicity with strength of design.

Assuming that a stanchion has the necessary strength, there are two vital points to consider: The first is the lock. The lock on the No. 999 STAR Tubular Stanchion can be operated with one hand. It is positive and cow-proof. It is so designed that no pressure applied in any manner either above or below will cause it to unlock—yet, with the thumb and finger it can be instantly released. To close the stanchion it is only necessary to slam the movable bar into place and it locks automatically.

The hinge on this stanchion was designed with a full knowledge of the unusually hard service demanded of a stanchion of this type. Its design and construction make hinge breakage impossible. The two-part hinge is built of pressed steel, rather than iron. The inside half of the hinge attached to the movable bar is slotted so as to regulate the distance that the stanchion can be opened and, at the same time, to distribute the strain between the large rivet operating through this slot and the heavy bolt upon which this hinge turns. While this hinge is securely bolted to the bars, a permanent connection is made by actually welding the hinge to the uprights, making a connection as secure as though all were of one piece.

Each stanchion is equipped with a crotch device attached to the movable bar which engages the frame in which it is hung. This holds the stanchion in place when open and prevents it from turning or twisting sideways.

The neck space is 7 inches in width.

Finish, gray enamel, thoroughly baked on.

No. 999 STAR Tubular Steel Stanchion, chain hung, as illustrated, weight, each, 17 lbs.



STAR Equipped Barn, at U. S. Indian School, Genoa, Neb.

No. 452 Star Adjustable Wood Stanchion

THE Star Adjustable Wood Stanchion offers all the advantages of any wood stanchion in addition to the adjustable feature.

The uprights are made of seasoned hardwood, and are very strong and durable. The crosspieces are of all pressed steel, securely bolted and held in place by malleable braces.

The stanchion is adjustable in neck width from 4½ to 8½ inches, and can thus be made to accommodate very young heifers or full sized cows. This adjustable feature means economy. It won't be necessary to buy stanchions of special sizes for special sized animals. Your stanchions will fit your herd *always*—no matter how it changes.

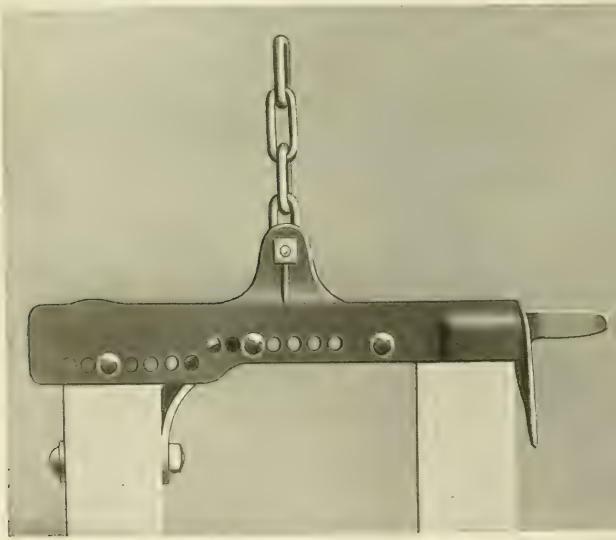
The latch is a vital part of the stanchion. The Star Adjustable Wood Stanchion locks automatically when slammed shut. The latch is made of a single piece of malleable iron, the simple gravity lock requiring no spring. This latch slides in between two pressed steel side plates, connecting the upper part of the stanchion, so that the movable upright is always guided when open.

The stanchion is also provided with a fork or yoke casting on the latch which holds the stanchion in proper position when open.

The stanchion is furnished with chain hangings, or if desired, with swivels. Be sure to specify which style of hanging is wanted when ordering.

No. 452 Star Adjustable Wood Stanchion, weight 15 lbs.





Stanchion Fastenings

ALL Star Stanchions are regularly furnished hung either single chain or swivel top and bottom. Where special fastenings, to attach single chain hung stanchions to wood or concrete are desired, those shown in Figs. 627 and 628 will answer all requirements. These attachments being all malleable, are light and strong.



Fig. 627

Note that 2½ x ⅜-inch lags are furnished for attaching the top malleable to wood. Machine bolts 3¼ x ⅜-inch are furnished to fasten the bottom malleable to concrete.

Attachments for single chain hung stanchions complete with two lags and two bolts, as illustrated, weight per set, ¾ pound.

When so specified, any of the various styles of stanchions will be furnished hung swivel top and double chain bottom, exactly as illustrated below.

The Star Double Chain Hanging has become so popular that we have been forced to supply it where stanchions are used in wooden frames. Formerly this hanging was furnished only in connection with Star Stalls.

This Double Chain Hanging is especially desirable for the reason that it permits the stanchion to hang as close to the curb as possible and because it gives the necessary freedom backward and forward without any tendency toward side motion.



Fig. 628

Star Double Chain Hangings with malleable curb fastenings, with 3¼ x ⅜-inch machine bolts, and top swivels with 2½ x ⅜-inch lags, as illustrated, weight per set, 3 pounds.

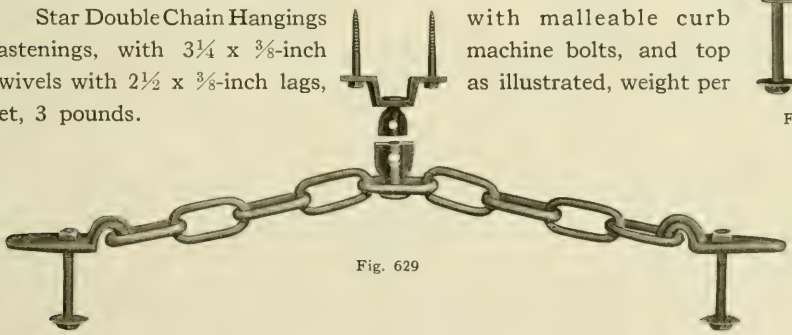


Fig. 629

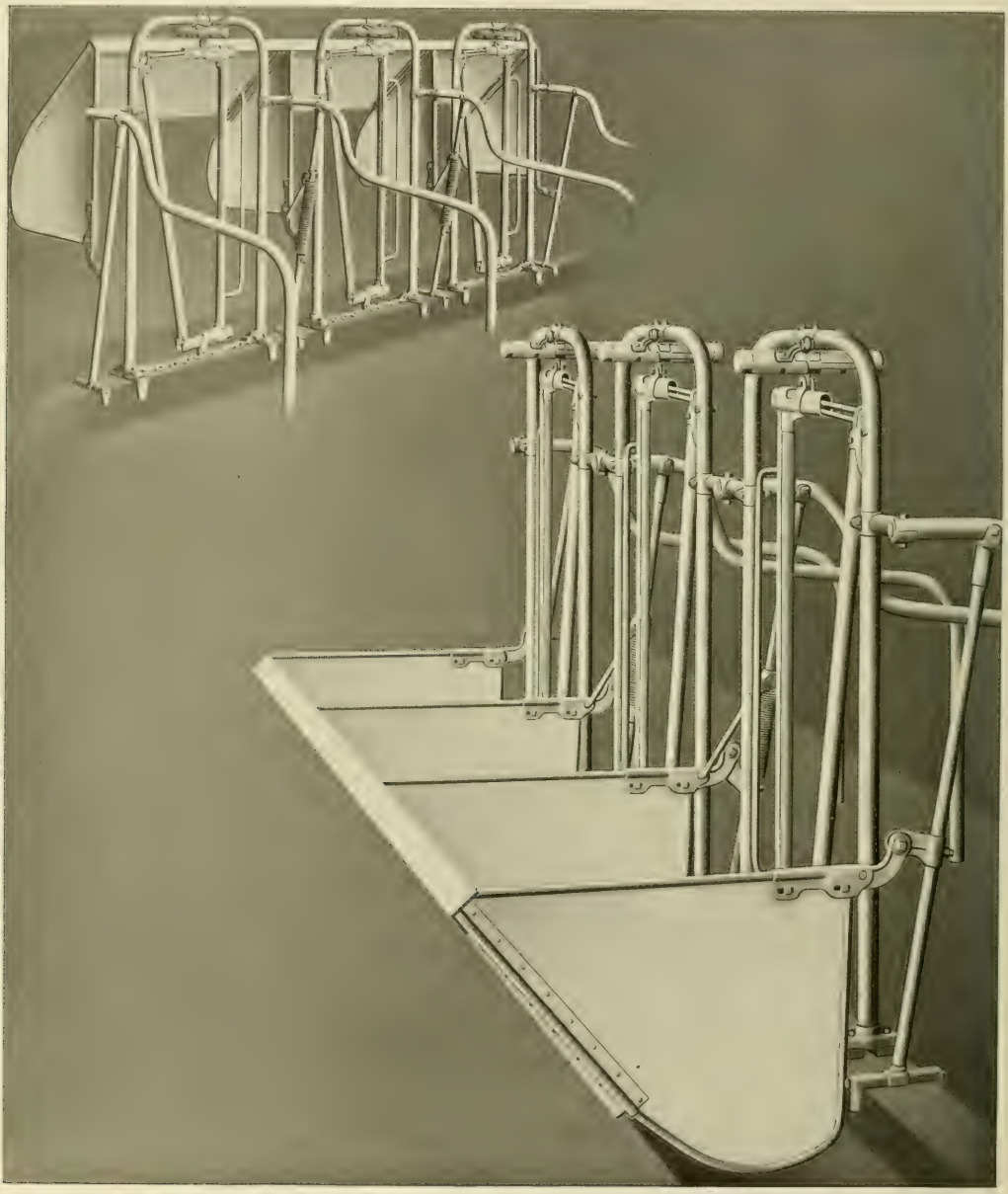


Fig. 523
Showing Mangers up for Cleaning or Watering

Fig. 524
Star Self Cleaning Steel Mangers in Place

No. 524 Star Self-Cleaning Steel Mangers

THE best results in feeding can be had only when the cows are fed separately. For this reason, an individual feed box is desirable in order to get full value from the feed consumed.

It is difficult to feed properly from a common trough. The cows that eat fast get too much; those that eat slowly don't get enough.

The STAR Self-cleaning Steel Manger affords an individual feed box for each cow so that the feed may be properly regulated.

These Mangers are constructed in sections of three, ordinarily, or they may be made in sections of two on special order. They are of heavy, 18-gauge galvanized steel, reinforced by steel angles to which they are riveted. They are fitted with counterbalancing springs which make it easy to lift them up. These springs are adjusted for stiffness to hold the Mangers up when the trough is being cleaned.

Owing to the heavy galvanized angle used along the front which gives a stiffness that could not otherwise be secured, STAR Steel Mangers are much more substantial than others. Even the edges of the partitions or divisions are rolled — no possible point that could make for durability or sanitation has been overlooked.

There is no bottom in these Mangers, the sections being so shaped that they fit into a shallow concrete trough which forms the bottom of the Mangers. This trough can be cleaned and flushed with water when the mangers are raised, and filled with water so that the animals can be watered in their stalls.

Where STAR Self-cleaning Mangers are to be used, we furnish free a wooden templet or form by which the concrete manger trough is properly shaped.

Finish galvanized and then covered with gray enamel, thoroughly baked on.

No. 524 STAR Self-cleaning Mangers, for use with any type of STAR Stalls, weight, each, 75 lbs.



STAR Equipped Barn, owned by Oneida Indian School, Oneida, Wis.

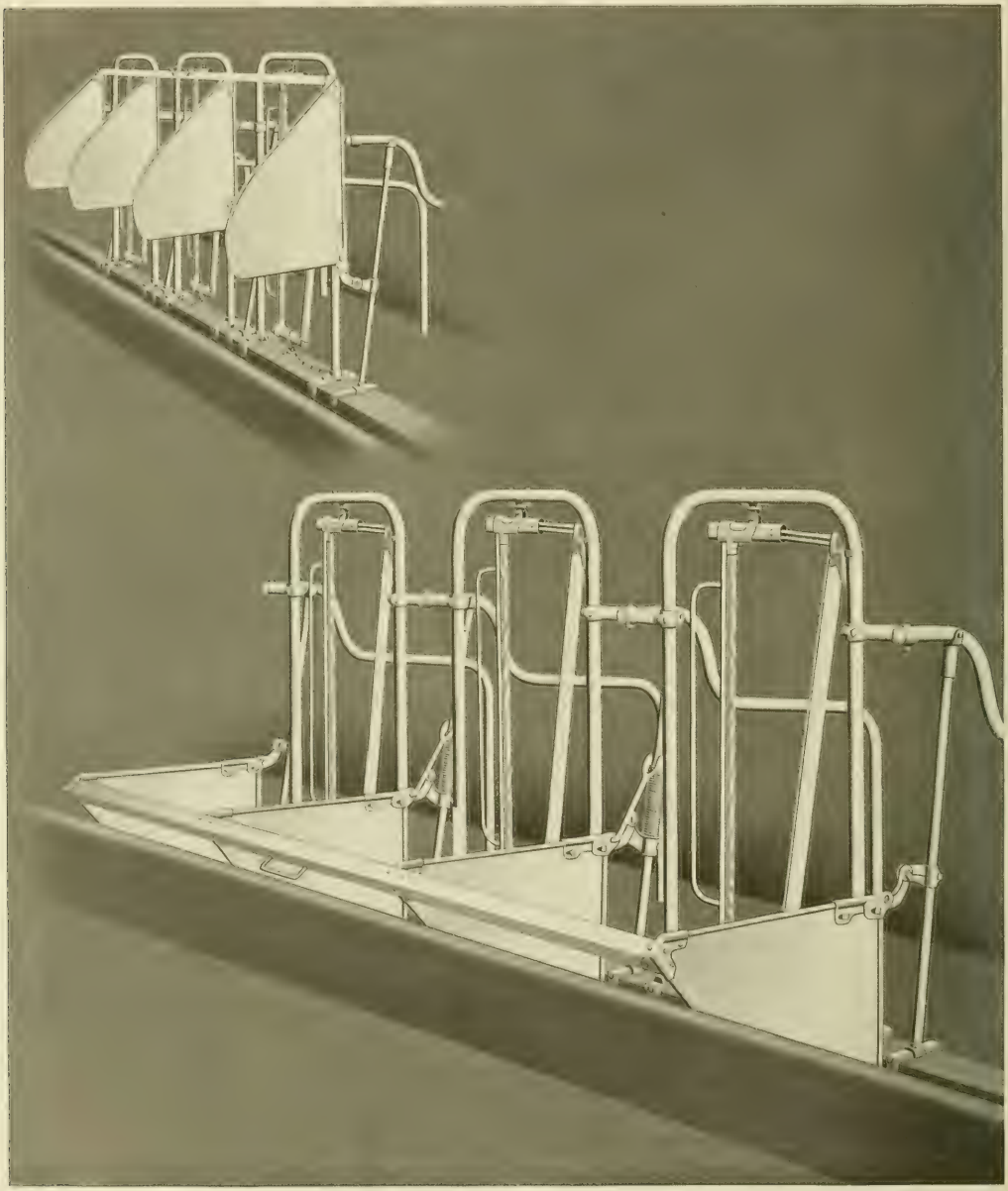


Fig. 764
Star Connected Manger Partitions Raised

Fig. 717
Star Connected Manger Partitions in Place

No. 717 Star Connected Steel Manger Partitions

STAR Connected Steel Manger Partitions are identically the same as STAR Self-cleaning Mangers, with the exception that the manger fronts are omitted. These manger partitions fit into a concrete trough which forms bottom and front of the mangers. This trough can be cleaned and flushed with water when the manger partitions are raised; also filled with water, permitting of watering the animals in the stalls.

They are constructed of heavy 18-gauge galvanized steel, reinforced by steel angles.

The rolled edges of these partitions and the heavy galvanized angle along the front, which connects them and permits of their being raised in sections, gives a stiffness and durability which could not otherwise be secured, and is found only in STAR Connected Manger Partitions.

Counter-balancing springs make it easy to lift them up and these springs are adjusted for stiffness so as to hold the manger partitions out of the way while the trough is being cleaned.

The connected manger partitions combine the good features of the complete mangers with those of the individual manger partitions and are meeting with universal favor.

Where our connected manger partitions are used, we furnish free, a wooden templet or form by which the concrete manger trough may be properly shaped.

Finish, galvanized and then covered with gray enamel, thoroughly baked on.

No. 717 STAR Connected Manger Partitions for use with any type of Star stalls, weight each, 25 lbs.



STAR Equipped Barn, owned by H. J. Ferris
Harvard, Ill.

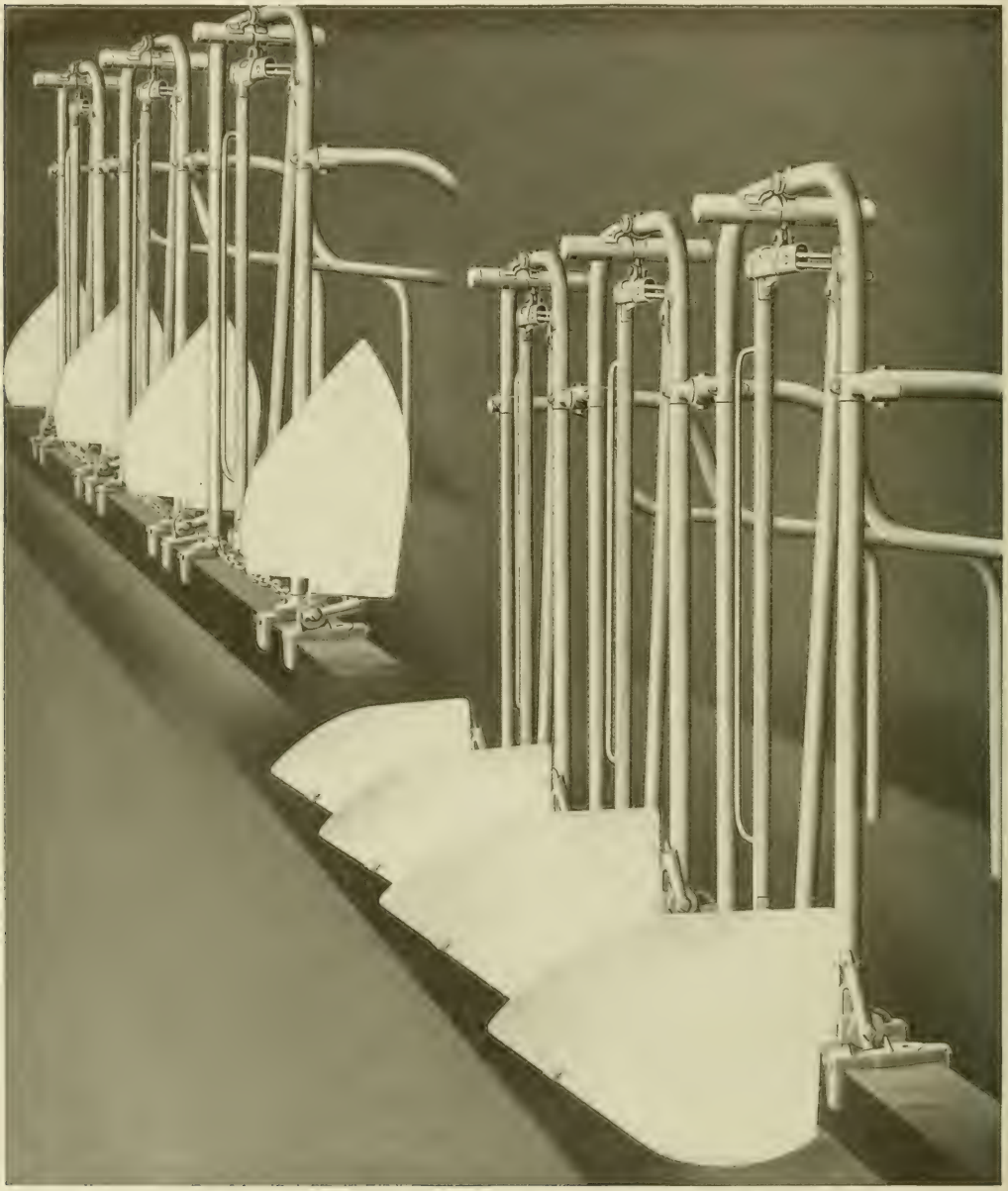


Fig. 516
Star Individual Manger Partitions Raised

Fig. 515
Star Individual Manger Partitions in Place

No. 515 Star Individual Steel Manger Partitions

BY use of Star Individual Steel Manger Partitions the concrete trough can be so divided that each cow has her own feed box. This effectively prevents one cow stealing from another; it prevents waste of feed; it gives the slow eater an even chance and enables you to give each cow just what you want her to have.

Star Individual Steel Manger Partitions place you in a position to feed properly and get the full value out of the feed consumed. Moreover, the danger of any cow overeating can be eliminated by their use.

They accomplish every purpose of the galvanized manger in spite of the fact that they cost less.

While the cows are being fed, Star Individual Steel Manger Partitions stay in place. They are perfectly smooth; no seams, rivets, heads or bolts project; so that it is impossible for the cow to catch hold of them and raise them.

After feeding, when the concrete manger is to be cleaned, the partitions can be lifted and not only raised up out of the trough but tilted clear back out of the way.

The steel of which these partitions are made, is thick and protected so that the chemical action of water and of the acids in silage has but little effect.

Their construction is so simple that there is nothing to get out of order.

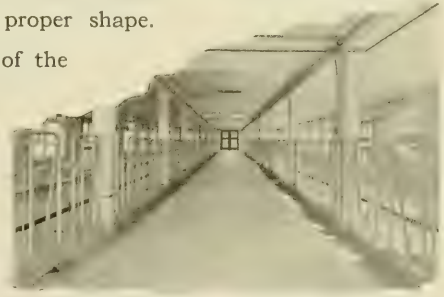
But the best of it is they cost so little in comparison with galvanized mangers and yet you get the same practical advantages, the saving of feed and the prevention of accident (by cows trying to reach too far for feed), the regulation of feed to the ration each cow should have—at just about half the cost.

To those who intend to use Star Individual Steel Manger Partitions, we furnish free a templet or wood form with complete instructions for making the concrete manger of proper shape.

No instructions for the installation of the manger partitions is necessary. Anyone can do it.

Finished in gray enamel, thoroughly baked on.

No. 515 Star Individual Steel Manger Partitions, for use with any type of Star stalls, weight each, 14 pounds.



STAR Equipped Barn, owned by H. J. Krebs
Wilmington, Del.



STAR WATER BOWLS KEEP UP MILK PRODUCTION DURING WINTER MONTHS

HUNT · HELM · FERRIS & CO ·

Star Sanitary Water Bowl

"I WOULD not own a cow barn 24 hours without either having a set of water bowls already installed, or having my order on the way to Harvard for them," said a prominent dairyman.

Water bowls are admittedly the biggest money-making equipment that any dairyman can put in his barn. They not only increase his income but decrease his expenses. They stop the winter slump in milk production. They save valuable time and work. They save high-priced feed. They help keep cows in better condition. They help prevent spread of disease among the herd. They better the growth of young stock.

But more important than anything else, they increase the production of milk so much that no dairyman is doing himself justice in trying to get along without them.

Increase the Income from Your Herd

No dairyman needs to be shown that his cows should have plenty of water. Everyone knows that the more water a cow drinks the more milk she will yield. Her milk is about 87 per cent water. It is as reasonable to expect her to go without water as to go without food. But many dairymen do not know how much MORE milk a cow will yield when she can drink not only all the water she wants, but exactly WHEN SHE WANTS IT.

A cow will drink more water if she can have it as she wants it, especially in winter when the tempered water given her in the stall is more relished than the icy water from the tank in the unsheltered barnyard. Some cows won't even drink warm water while fighting a blizzard in an open yard.

It is estimated that a good dairy cow should drink from 14 to 18 gallons of water every day. High producing animals require much more. They simply have got to have it if they are to give their maximum production of milk.

STAR Sanitary Water Bowls answer the problem. They keep a plentiful supply of water before the cows constantly. And like STAR Stalls and Stanchions, they have many exclusive features. Features that mean much to you in economy of installation, ease in keeping the bowls clean and sanitary, and having a better looking equipment when installed.

STAR Water Bowls are strictly sanitary. They are open so that the purifying sunlight and air can enter the bowl. They are individual; there is no way in which water can run from one bowl into another—no danger of one bowl contaminating the water in another.

Operate Under Any Pressure

STAR Water Bowls are fitted with automatic valves which operate under any kind of pressure. They may be connected with a direct pressure system or a storage tank, which is usually placed in the loft above the stock.

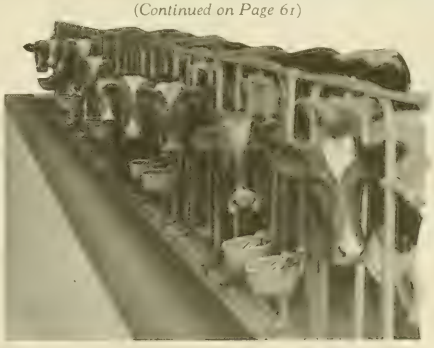
The water is admitted through the valve at the top of the bowl. A valve lever in the form of a "leaf" or "paddle" 7 inches long is hinged at the top and hangs down into the bowl at an angle. When the cow presses upon the lever the water runs into the bowl. When the pressure on the lever is relaxed, a spring closes the valve automatically. This is a good stiff spring, strong enough to keep the valve closed tightly, but placed so that it yields readily when the cow's nose presses down on the long lever in the bowl.

Valve Easily Removed

The principal working part of the valve is made of brass. The valve is put in with graphite, so it cannot corrode. There is no danger of its becoming clogged, because nothing but the pure, clean water direct from the supply pipe passes through it. If it is necessary to renew the Fuller ball, or if for any other reason you wish to remove the valve, it can be easily taken out. Being at the top of the bowl, it is easy to get at.

This valve at the top of the bowl interferes in no way with cleaning, and the valve lever which opens the valve also lifts up out of the way.

(Continued on Page 61)





INCREASED MILK FLOW CONSIDERABLE

Hunt, Helm, Ferris & Co.
Gentlemen:

"My experience has been that the increased flow of milk from thirty cows in one of my barns paid the cost of one STAR Water Bowl every day, or in other words, each water bowl paid for itself in thirty days."

I. T. HURD,
Davison, Michigan.

STOPPED COWS FROM DRYING EARLY

Twelve Corners, Wis.,
Dec. 18, 1918.

Hunt, Helm, Ferris & Co.

"Have used your water bowls for two years and am very much pleased as I have always had trouble with cows drying early but not so since I have in the bowls and must say I never had any trouble with the bowls." Yours truly,

GUS. SCHROEDER,
Black Creek, R. R. No. 2.

GETTING MORE MILK

Hunt, Helm, Ferris & Co.
Gentlemen:

"My cattle look 20% better than they did when I had to turn them out in the yard. I had other bowls but took them out and put in STAR. The milk I never weigh but I know there is a great increase."

B. G. FLOCK,
Lisbon, New York.

Star Sanitary Water Bowl

(Continued from Page 59)

This valve lever is made of malleable iron, and has smooth, round edges on which it is impossible for the cow to catch or cut her tongue. The bowl is shaped so her nose fits into it conveniently and the edge is rolled to protect her mouth.

Connect Either Above or Below

A patented feature of the STAR Water Bowl is that you can connect the supply pipe from either above or below. Both top and bottom of the valve chamber are drilled and threaded for the supply pipe. The pipe is inserted at one end and a plug at the other.

The supply pipe can run along above, or be laid below under the cement, or along the curb.

Saves Labor and Pipe

The fact that STAR Bowls can be piped into from below means a big saving where the main supply pipe runs below the bowls. It saves about a foot of pipe, and a "goose-neck" made of two elbows and two pipe nipples. It saves also the work of connecting four extra joints, which would be necessary if it were possible to connect the supply pipe only at top of bowl.

STAR Water Bowls are also furnished with attachments to fasten to wood. No extra charge is made for these.

When ordering be sure to specify whether bowls are to be fastened to steel stalls or to wood.

The STAR Water Bowl can also be used for watering hogs. In installing, it is of course necessary to place the bowl low enough so that the hogs can drink conveniently. Suitable fastenings can be supplied for attaching the bowl to wood or with clamps for attaching it to steel posts or pens.

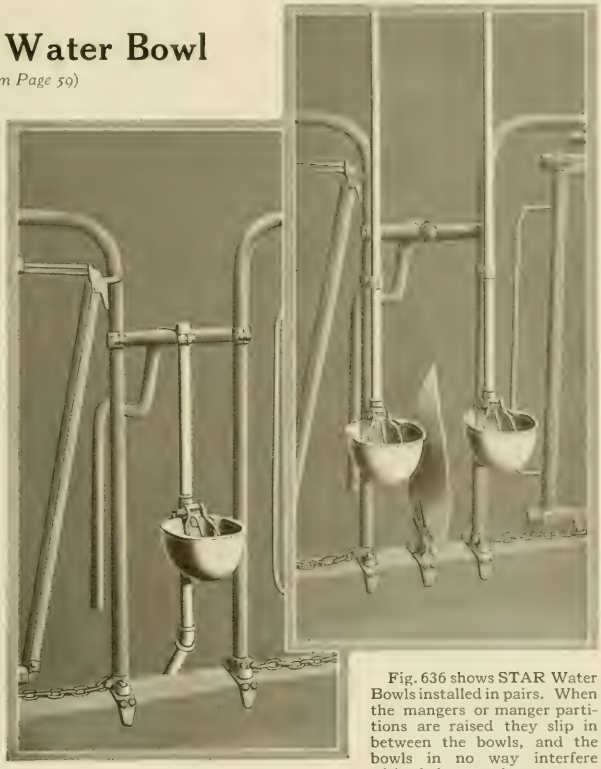


Fig. 635 Shows a method of installing a single STAR Water Bowl. For economy, the bowl is placed between two stalls, so that one bowl serves two cows.

Fig. 636 shows STAR Water Bowls installed in pairs. When the mangers or manger partitions are raised they slip in between the bowls, and the bowls in no way interfere with their operation.



Star Bowls Are Easily and Quickly Detached

THIS is an important point. It means much to you in saving time in cleaning and being able to keep the bowls clean all of the time. When you clean STAR Bowls you do not have a lot of complicated devices to contend with. Simply lift the bowl off and clean it. Note the illustrations below and on page 63.



To remove the bowl, simply raise the catch below the bowl with the finger and lift the bowl from its position.

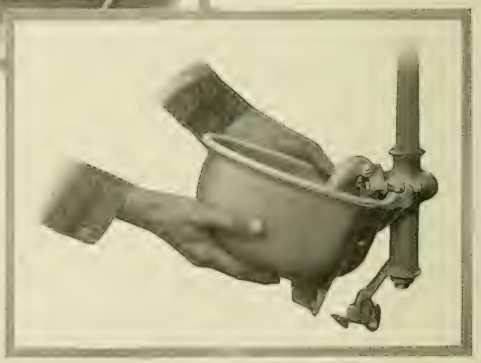


The STAR Bowl is exceptionally easy to clean. The entire bowl is cast in one piece with no square corners or openings to catch impurities. It is oval in shape with a rolled edge, which allows the cow's nose to fit into it comfortably. It is finished with a heavy coat of STAR Special Gray Enamel.



The valve lever or "paddle" on STAR Bowls can be raised instantly to allow free access to the bowl without removing it from its position.

STAR Bowls are open which means allowing purifying air and sunlight to enter. A cow will drink more water when she can see it all the time.



To replace the STAR Bowl, place the lugs in the ears on each side of the valve chamber, and bring the bowl to a level position.

"GETS 3 MORE CANS OF MILK"

Dear Sirs:

I have recently installed a set of the STAR Sanitary Water Bowls in my stables, which I purchased from you, and to say that they are entirely satisfactory in their operation, results obtained and ease with which they can be placed in the barn, but feebly expresses my pleasure in their possession. I would not be without them.

We are making at present about eleven cans of milk, whereas with the same number of cows before installing the BOWLS we had difficulty in producing eight cans, feeding practically the same. I take pleasure in recommending your barn equipment to any prospective purchaser.

R. K. WOODWARD,

Dec. 23, 1918. Sharon, Conn.

"INCREASE PAYS FOR THE OUTFIT EVERY 35 DAYS"

Hunt, Helm, Ferris & Co.,
Harvard, Ill.
Gentlemen:

I am glad to report to you how satisfactory the water bowls are that I bought of you in 1917.

I started using 8 of your automatic bowls on Nov. 20, 1917, after having installed them in my barn at a total cost of $85.11, including bowls, pipe fittings, tank and labor.

I milked the same 15 cows in 1917 as I did in 1916 and as I had my milk record for 1916 to compare with 1917, I am in a position to know exactly what the results of plenty of good water are on the milk flow.

My cows were in practically the same condition both years and the feed was as near alike as could be in the two different years, and the cows gave from 4 to 7 lbs. a day more in 1917 than they did in 1916, or an average of 82½ lbs. per day for the 15 cows. This figured at $3.00 per 100 lbs. would pay for the outfit every 35 days.

So you see it is useless to ask if I would go back to the old system of watering cows.

Respectfully yours,

C. H. MANN,

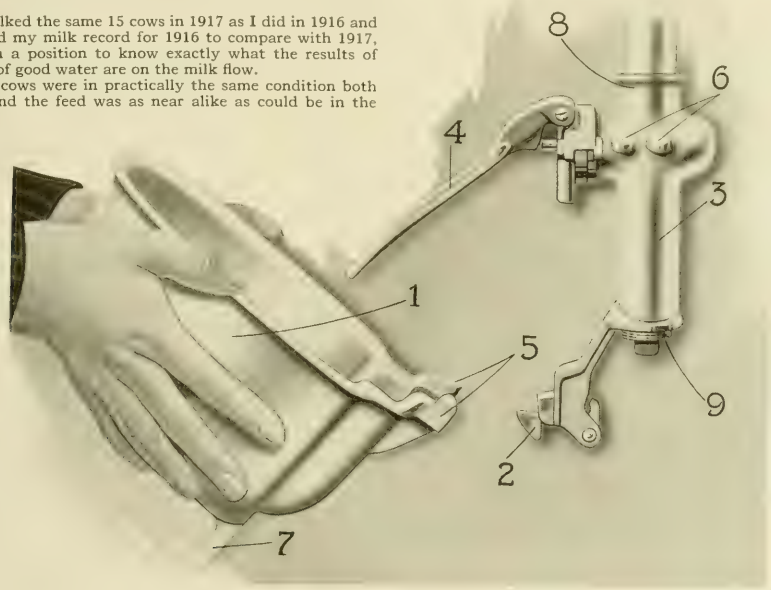
Nov. 5, 1918. Woodstock, Ill.

"COULD NOT GET ALONG WITHOUT THEM"

Answering yours of the 20th inst., will say that we do not see how we could get along without the water bowls in both our milking barn and our maternity barn. They have never given us any trouble, and in winter time especially, we feel they are one of the best assets in our barns. I cannot recommend them too highly.

EDWIN S. KELLY,
Of the Kelly-Springfield Tire Co.

November 22, 1918. Springfield, Ohio.



To remove the STAR Bowl, simply raise the catch (2) with finger and lift bowl from its position.

To replace bowl, place lugs (5) between ears (6) on each side of valve chamber (3) and bring bowl into position.

With STAR Bowls, the supply pipe may enter either from above (8) or below (9). The pipe cap fits either opening.

Star Stalls Fit Anywhere



Fig. 508

Above are shown the arms used with Star Stalls of regular widths. The shortest arms are used for three foot stalls, the longest for three and one-half foot stalls and the medium length for stalls three feet three inches wide.

THE arches or stanchion frames of Star Stalls are regularly made in one size, but the stalls themselves may be of any desired width. The width of the stall is determined by the length of the malleable arms which connect the frame or arch to the stall partitions.

The illustrations on this page show the several styles of simple connections which make it possible to fit Star Steel Stalls to any conceivable arrangement as to size or location.

In Figure 508 are shown the three regular sizes of arms for stalls No. 10 to 18, inclusive. These arms used with regular arches will make either three foot, three foot three inch or three foot six inch stalls.

The illustration at the right shows the manner of attaching stalls to wooden posts located in or at the end of the stall row. When necessary to attach stalls to wooden posts, specify exact size of posts, distance apart on center, and whether these posts are located flush with or back of manger edge of cement curb.

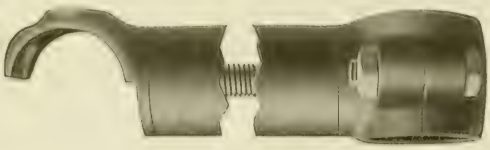


Fig. 623

Special Arm for Making Stalls No. 10 to 18 Any Width Desired.

The above illustration shows the special arm by which Star stalls can be made any desired width. The two malleable parts fit perfectly into the ends of a short piece of one and five-eighths inch O. D. pipe and are connected by a five-eighths inch full thread bolt. The piece of pipe can be cut to the required length for any width stall.

When ordering special arms, specify exact distance from center of arch upright to center of stall partition.

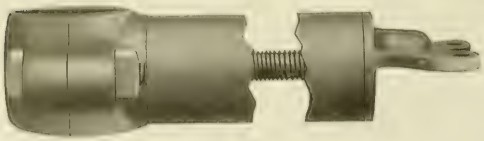


Fig. 624

Special Arm for Making No. 20 Stalls Any Width Desired

The special arm shown in Fig. 624 is used in connection with regular width stall arches to make No. 20 Stalls any width desired.

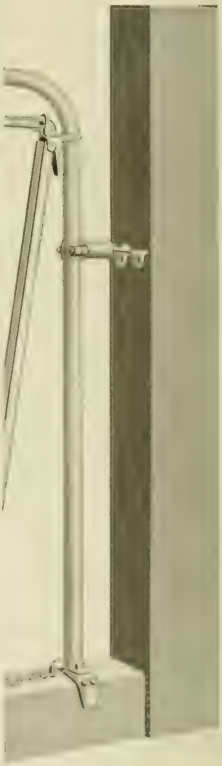


Fig. 625

Malleable brackets fastened with lag screws as shown above are used to attach Star Stalls to wooden posts located in stall rows or to wooden partitions or wall at ends of rows.

When ordering special arms for No. 20 Stalls separately, specify exact distance from center of arch to center of steel column to which arm is to be attached, also state the outside diameter of column.

Star Equipment Easily Moved



Fig. 639
Star Cement Anchor

AMONG the important patented features added to Star Barn Equipment is the Star Cement Anchor. It can be used to secure stall partitions or the uprights of Star Steel Pens, which otherwise would have to be permanently imbedded in the concrete.

The advantage of using these anchors with Unit System Star Stalls will be instantly seen. The stall partitions can be quickly removed as well as the stall arches, leaving the entire barn floor clear of equipment, if desired.

This patented anchor used with Star Barn Equipment makes it possible for the dairyman to remove any or all of his equipment at any time. This leaves the barn entirely free from all obstructions should he desire to use it for any other purpose.

Being constructed of the best grade of malleable iron obtainable, the Star Anchor is practically everlasting as compared with steel. The actual details of this construction are shown in Fig. 640. It is made in two parts, connected by $\frac{7}{16}$-inch bolts. The top of the lower part of the anchor is flush with the concrete floor. After the concrete is set, the two $\frac{7}{16}$-inch bolts are slipped into place. The foot of the stall partition or pen upright is inserted and securely held by the upper part of the anchor which fits over a pin extending through the partition or upright. The bolts connecting the upper and lower part of the anchor can be instantly replaced if ever necessary.

To remove a stall partition or section of pen, simply loosen the bolts which hold the two parts of the anchor together. Star Cement Anchors are shipped attached to the ends of the stall partitions or to the pen uprights as specified. This insures their being properly located in the concrete.

Star Cement Anchor finished in gray enamel; weight, each, 2 pounds.

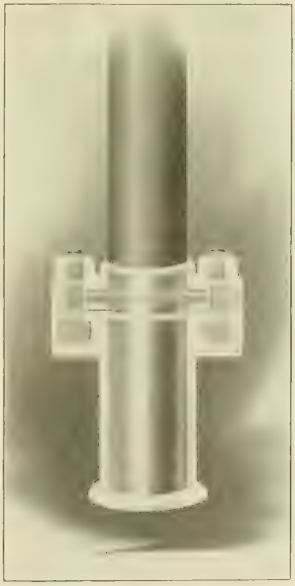


Fig. 640

Stall Partitions and Fittings

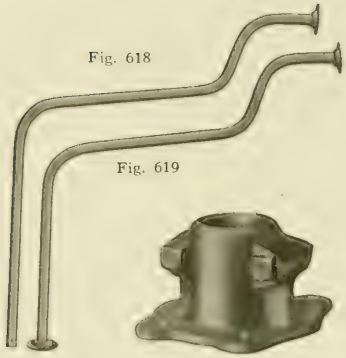


Fig. 618

Fig. 619

Fig. 719

Finish—Gray Enamel, Baked On

No. 618 Star Stall Partition for cement floor and wood upright, weight each, 14 pounds.

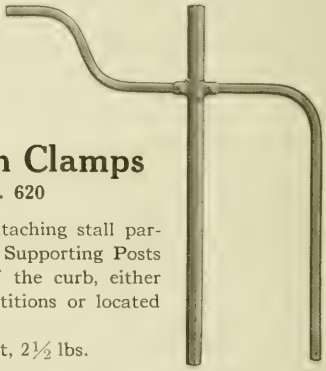
No. 619 Star Stall Partition for wood floor and wood upright, weight each, 15 pounds.

Star Split Flange

No. 719

Star Split Flanges can be quickly attached to stall partitions intended for cement floor, thereby adjusting them for attaching to wood floor.

Weight each, 1¼ lbs.



Partition Clamps

No. 620

Clamps for attaching stall partitions to Steel Supporting Posts located back of the curb, either dividing the partitions or located at the rear end.

Average weight, 2½ lbs.

Fig. 620

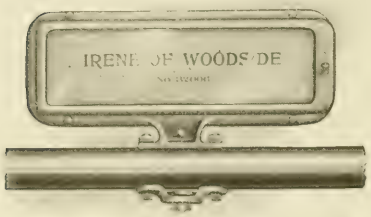


Fig. 536

Star Name Plate

No. 536

The Star Name Plate is a malleable frame fitted with two pieces of celluloid between which the name or record card is placed.

Name plates furnished in gray enamel finish.

Weight each, 2½ pounds.

Star Neck Chains

No. 758

In many dairies, especially those producing certified milk, neck chains are used to keep each cow on her feet when in the stall. These chains hang between the stall uprights and prevent the cow from lying down after the udder is washed before milking.



Fig. 758
Star Neck Chain

No. 739 Star Chain Alley Gate

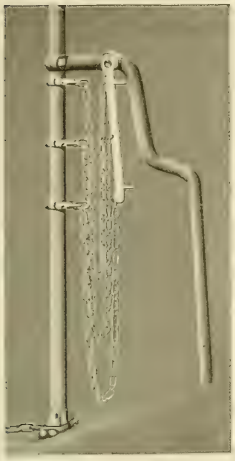


Fig. 718—Star Chain Alley Gate Hung Up When Not in Use.

THE merit and operation of the Star Chain Alley Gate are so obvious upon inspection that it needs comparatively little comment.

In the first place, by merely lengthening or shortening the chain, it can be made to fit any opening.

Where it is impossible to secure absolutely accurate measurements or there is a possibility of slight changes later, the Star Chain Gate is the only practical one to use. It is fitted with a simple Automatic Lock. Its very simplicity is the best proof of durability and it can be adapted to practically any width of opening.

When not in use, it is suspended from stall partitions on either side, entirely out of the way.

The Star Chain Alley gate fills a long felt want in a highly efficient manner.

Finished in gray enamel, thoroughly baked on.

When ordering specify distance from center to center of stall arch uprights, or distance from center of stall arch upright to wall.

Weight of 3 ft. 6 in. gate, 8 lbs.

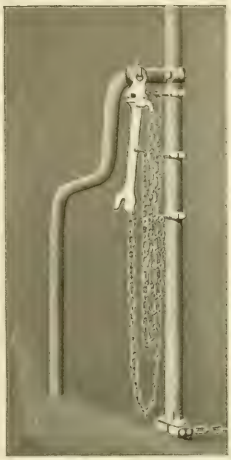


Fig. 718—Star Chain Alley Gate Out of the Way When Not Being Used.

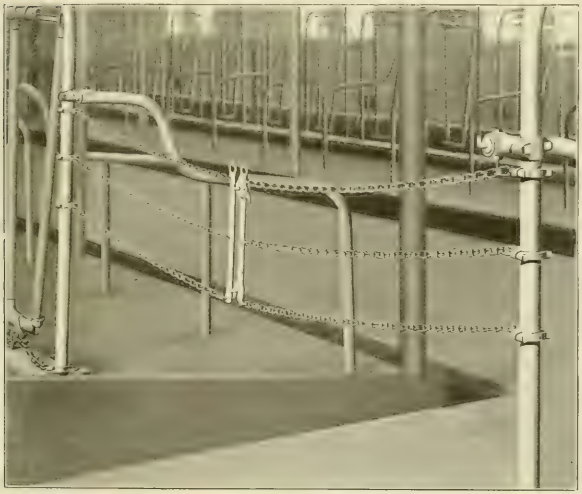


Fig. 739—Star Chain Alley Gate in Actual Use.

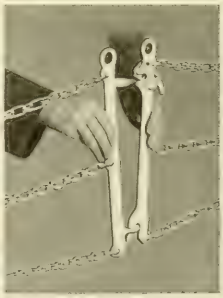


Fig. 738—The Star Chain Alley Gate Locks. Automatically.

No. 626 Star All-steel Columns

A STAR All-steel Column will support more than a wooden post twice its size.

These steel columns in the long run are cheaper than large, clumsy insanitary wooden supports.



Fig. 626

They offer less obstruction to light and ventilation. They are sanitary and easily cleaned.

Star All-steel Columns are not mere shells in which to build concrete columns. Their strength is in the steel itself; no filling is needed. They can be filled with concrete if desired and the cost to fill them "on the job" will be less than the extra freight if they were filled with concrete before shipping.

Star Stalls can be made to conform to any arrangement of steel columns supporting the loft.

Columns of any length furnished in five sizes, as shown in the table below.

Safe Load in Tons
(One-fourth of Ultimate Capacity)

Outside Diameter Column Inches	7 ft.	8 ft.	9 ft.	10 ft.	Weight per ft. pounds
2 3/8	4	3½	3½		3½
3	5½	5	4¾	4½	3½
4	9¾	9¼	8¾	8	5½
5	14	13½	13	12½	7½
6	19¾	19¼	18½	18	10

Caps or Bases for Columns

Outside Diameter Column Inches	Size Inches	Weight pounds
2 3/8	4 x 4 x ½	2½
3	5½ x 5½ x ½	4
4	6 x 8 x 5/8	6½
5	8 x 8 x ¾	10
6	8 x 10 x 1	17

Star Steel Pens Combine Safety With Comfort

ALL STAR Steel Pens have uprights of the highest grade of steel pipe inserted into top and bottom bannister railings of rectangular or square steel tubing. This design not only eliminates all unnecessary clamps, but provides strength and security obtainable in no other way. The panels are held rigidly together by long bolts or tie rods running from top to bottom rails through the uprights. This style of construction leaves the rails absolutely smooth, easy to clean, and keep clean.

STAR Steel Pens are designed for animal comfort. They should be large enough to provide plenty of space for exercise. The construction itself assures cleanliness. Absolute security is assured without interference with either ventilation or light. STAR Steel Pens are designed to give lasting service without any up-keep expense.

Star Pen Gates Can't Sag

In the design of the gates used with STAR Steel Pens, two vital points were constantly kept in mind: First, to guarantee a gate that could not sag; Second, a lock not only mechanically perfect but impossible to get out of order. How successful we were is evident from the gates themselves. The gates on all STAR Steel Pens are made with a one-piece continuous arch over the top, in addition to the regular top rail. This arched gate is then mounted in another arch, the legs of which extend into the concrete, binding the sections of panel together permanently. The arch within an arch gate construction, used only in connection with STAR Steel Pens, is a permanent guarantee against sagging. This construction is absolutely rigid and the strongest known. Each arch is of the same style of construction used in STAR Unit System Steel Stalls.

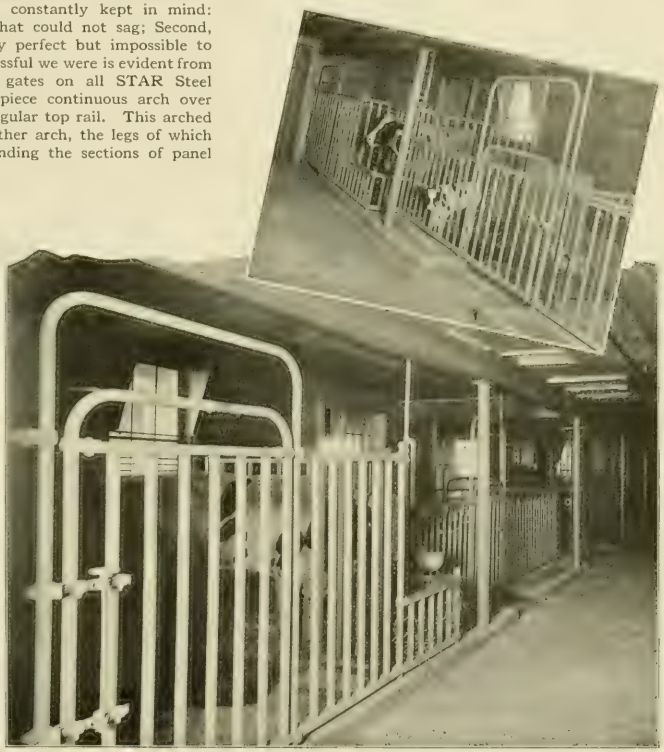
Bull and Cow Pen Gates are fitted with an extra heavy double plunger lock; calf pens, with an extra heavy single plunger lock of the Hall Safe pattern type. Just slam the gate shut and it locks automatically. It is unlocked by turning a 4-inch wheel. It cannot possibly be opened by accident.

Each gate is hung on offset hinges which allow it to swing back against the panel when open. It never sticks out to block the passage-way in front of the pens.

Assembled Before Shipment—Shipped in Panels

STAR Steel Pens are made in panels, or sections, of any desired length. Each panel, or section, is completely assembled at the factory before shipping. When installing, simply couple the corners and set the corner and gate posts into the cement. This means a distinct saving in time and expense. It gives a sanitary pen, simple in design, easy to install and at a minimum cost.

The same care is used in finishing STAR Steel Pens as STAR Unit System Stalls and Stanchions. The steel is carefully cleaned so as to be absolutely smooth and free from scale or grease when the Gray Enamel is applied.



Pen Department of STAR Equipped Barn, owned by B. B. Bell, Harvard, Ill.

Galvanized Lifting Manger

The Galvanized Lifting Manger, illustrated, is very convenient and practical for feeding purposes. The springs hold the manger in position when fully raised, or when as shown in the illustration. When raised the manger is entirely out of the way so that the feeding trough can beeasily cleaned.



Automatic Hay Rack Saves Hay

The STAR Automatic Hay Rack can be used in connection with all STAR Steel Pens. It prevents the waste of hay. This rack is locked open while being filled; when lock is released, strong springs press front and back together and the hay is compressed against the back within easy reach of the animal. Only a mouthful at a time can be taken. This prevents waste.



Fig. 630
R STEEL BULL PEN



STAR STEEL BULL PEN WITH SET BACK MANGER AND MANGER GATE

HUNT · HELM · FERRIS & CO ·

No. 630 Star Steel Bull Pen

MUCH depends upon the health and vitality of the sire of the dairy herd. His quarters should provide a place for moderate exercise, where he will be comfortable, absolutely safe, and at the same time within sight of the herd. STAR Steel Bull Pens meet just such requirements.

The Pen shown on the opposite page, is the same as that illustrated on pages 70 and 71 with the exception that the bull stanchion is shown set back to permit a concrete manger being used.

The advantages of having the stanchion set back are many. In the first place, no space is taken up in the feed aisle or walk in front of the pen. This arrangement makes it very convenient to place the water bowl outside rather than inside the pen, so that it is completely out of the way.

The manger gate, in front of the stanchion, is hinged so that it can be opened readily, allowing free access to the manger for feeding and cleaning. The idea of using a manger gate in front of the concrete bull or cow pen manger is a big advantage over the old way of having a stationary panel built up which was always in the way and which made it impossible to conveniently clean the feed manger.

The concrete manger bottom can be rounded so that there are no square corners and so that the manger may be conveniently kept in a clean, sanitary condition.

Where one has plenty of alley room in front of the pen, the galvanized lifting manger, illustrated in connection with the bull pen shown on page 70, answers the purpose very nicely.

The STAR steel bull pen is usually fitted with an adjustable rigid stanchion. It is made of U-bar steel of the same weight as that used in the Giant STAR stanchion shown on page 42. The wood lining which is fitted into the U-bar uprights means comfort to the bull and safety to those who work around him, because it increases the strength of the uprights and prevents the stanchion from springing or bending.

The pen is 5 feet high. The top and bottom rails are of $1\frac{5}{8}$ by $2\frac{5}{8}$ inch O. D. rectangular steel tubing, laid flat. The uprights of $1\frac{5}{8}$ inch O. D. round steel pipe are 6 inches apart from center to center.

Gate fittings include double arch, hinges and automatic safety lock. STAR Steel Bull Pen may be fitted with rigid wood lined adjustable steel stanchion and STAR Self-Cleaning Lifting Manger, additional weight, 100 lbs., or with a STAR Automatic Hay Rack, size 36x36 inches, weight, 42 lbs.

Entire pen finished in gray enamel. Average weight per foot, 30 pounds.

When ordering or when writing for a quotation, send along a rough sketch showing the measurements, as this construction is built to order. Estimates will be gladly furnished.



A STAR Bull Pen Affords Comfort to the Animal and Security to the Owner

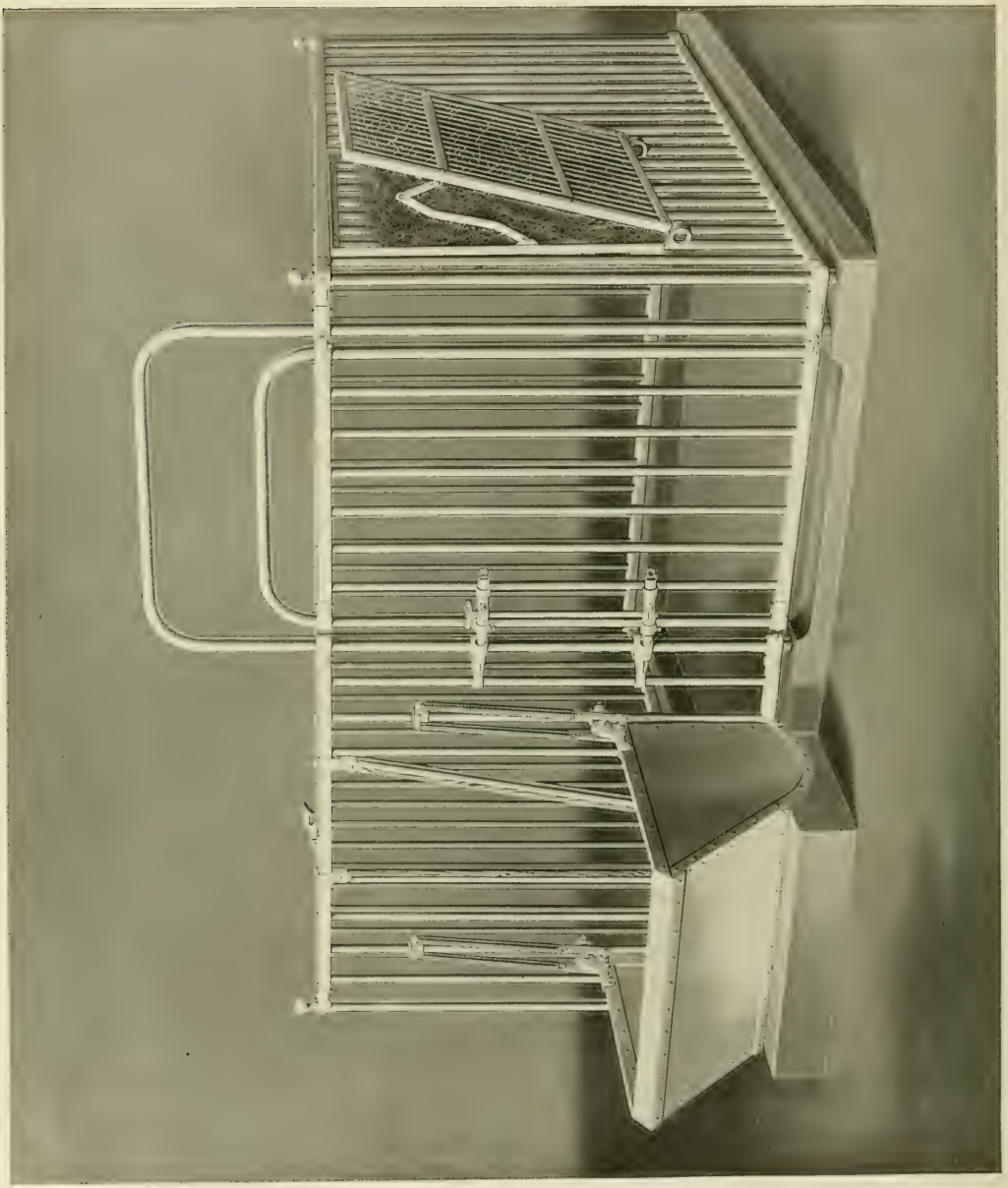


Fig. 631
STAR STEEL COW PEN

No. 631 Star Steel Cow Pen

At the time of sickness among domestic animals proper care is often the secret of recovery, and costs nothing but a little attention and the application of good common sense in the care of the animals.

There is too much risk involved in allowing cows to pass through the calving period in the old style rigid stanchions. There is the risk of losing the calf, and of injury to the mother. The tender, sensitive mother needs more careful attention at this time than at any other. She needs quarters that are clean and roomy, and where she may be quiet, comfortable, easily fed, and have plenty of light and fresh air.

So the need of a good box stall or cow pen is apparent.

STAR Steel Cow Pen is the acme of cleanliness, convenience and sanitation. It can be easily disinfected and placed in perfectly sanitary condition. The open style of construction does away with dead air "pockets" in corners, between floors and walls.

STAR Steel Cow Pen is simple in construction, strong and sanitary. The top and bottom rails are made of 1½-inch square steel tubing. The corner posts are of 1⅝-in. O. D. steel pipe. The upright bars are made of 1⅛-inch O. D. steel pipe and are placed 5 inches apart on centers and are inserted into top and bottom rails. Through every fourth upright a ½-inch tie-rod connects the top and bottom rails. The top and bottom rails are thus tied at intervals of 20 inches; so that this construction does not depend for its strength upon the fastenings at the ends of the panel.

The top and bottom rails are both free of clamps and other dust catchers.

The gate openings are 3 feet 3 inches wide. The gates are constructed like other parts of the pen except that the end uprights, in addition to being connected by the regular top rail and its heavy malleable couplings, are also connected by a continuous one-piece arch. This arch gives double strength and rigidity to the gate.

The gates are fitted with automatic locks which cannot possibly be opened by accident.

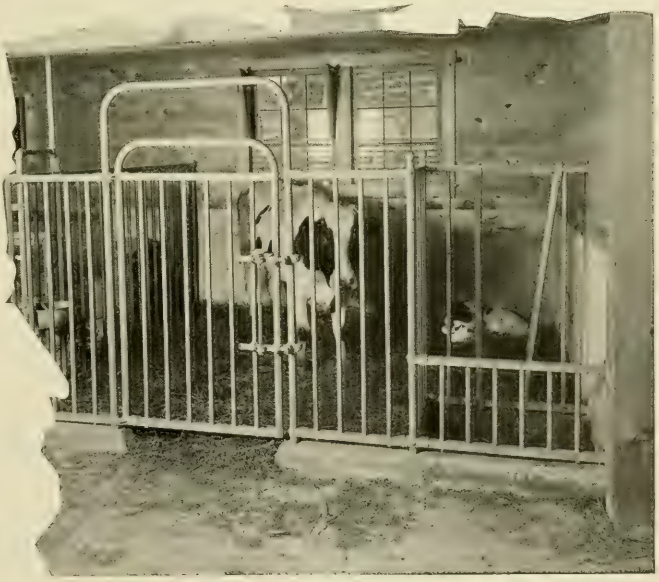
They are swung in arches which conform to the same style of construction as STAR steel stalls. The offset hinges permit the gate to swing back flat against the panel when open. This is a convenience, as the gate will never stick out into the alley or drive.

STAR Cow Pen may be fitted with an adjustable stanchion. The uprights of this stanchion are made of U-bar steel, the same as is used in the Giant stanchion illustrated on page 42. The wood core or lining completely fills the U-bar. This prevents the bars of the stanchion from springing out of shape, and is quite a marked improvement over the tubular stanchions usually furnished with pens.

Cow pens can be had in panels or sections of any desired length. Each panel or section is assembled at the factory. The corner posts and the legs of the gate arch are all that need to be imbedded in cement, so that installation is simple and easy.

STAR Steel Cow Pen, height 5 feet, finished in gray enamel, average weight per foot, 20 lbs.

Gate fittings for STAR Steel Cow Pen include double arch, hinges and automatic safety lock. STAR Steel Cow Pen may be fitted with rigid wood lined adjustable steel stanchion and STAR Self-cleaning Lifting Manger, additional weight, 100 lbs., or with a STAR Automatic Hay Rack, size 36x36 inches, weight, 42 lbs.



Comfortable and Contented in a STAR Steel Cow Pen

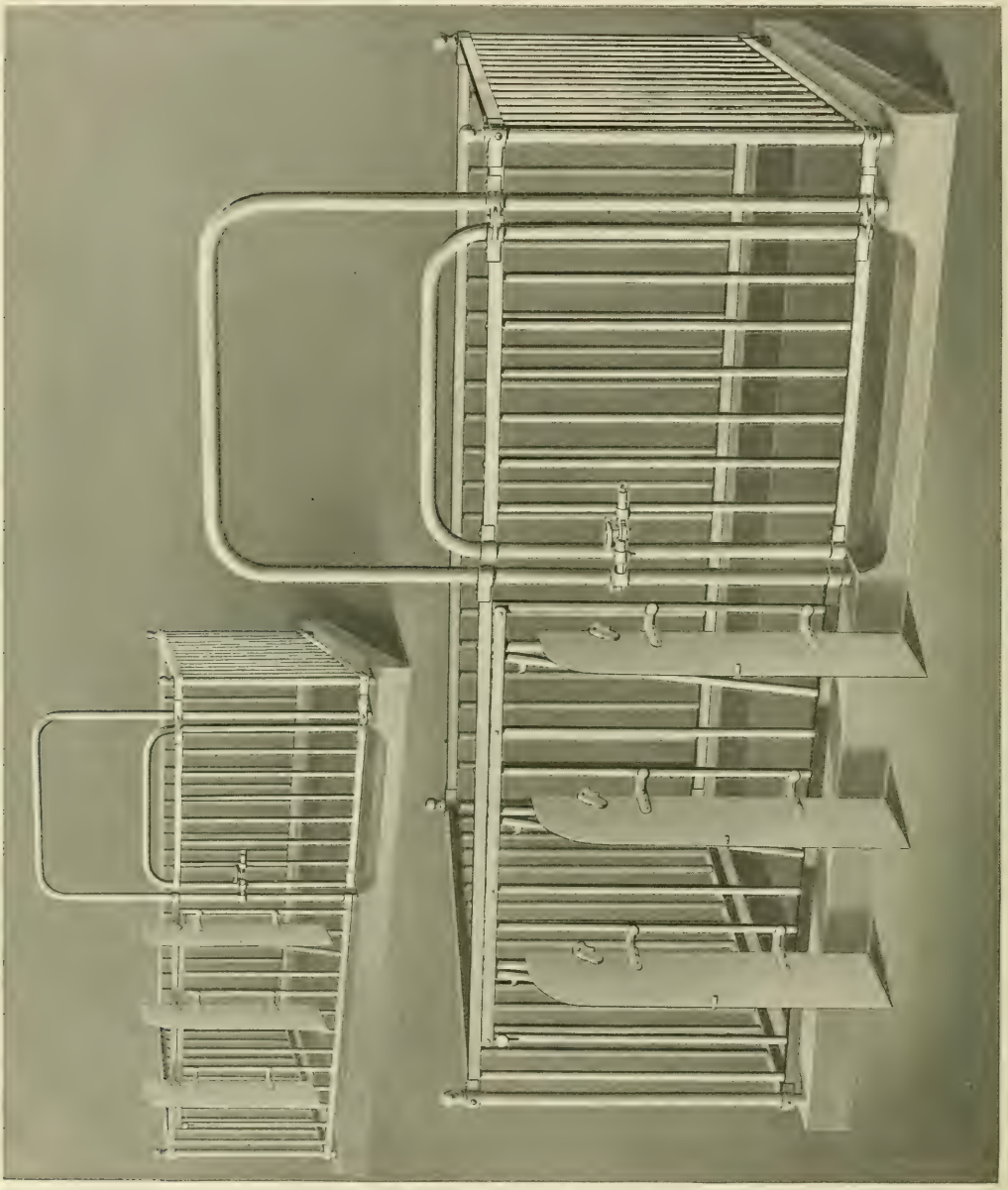


Fig. 632
STAR STEEL CALF PEN (Equipped with Feed Guards)

No. 632 Star Steel Calf Pen

EVERY careful breeder, dairyman and herdsman knows that the ability and productive value of the mature cow depends largely on the treatment and care the animal gets while young. Many calves are lost each year from causes which might easily be avoided.

For calves to grow successfully they must be comfortably housed in clean, sanitary surroundings and have plenty of fresh air and sunshine.

The Star Steel Calf Pen is strong, sanitary and of few parts. It offers the least possible obstruction to light and ventilation.

The top and bottom rails are of 1½-inch O. D. square steel tubing. The corner posts are of 1⅝-inch steel pipe. The uprights and stanchions are of 1⅛-inch O. D. steel pipe set 4 inches apart. The ends of the uprights are inserted into the top and bottom rails, dispensing entirely with the use of clamps and leaving the rails absolutely smooth.

Each panel or section is assembled at the factory. The corner posts and the legs of the gate arch are all that need to be embedded in cement.

The gate is hung on offset hinges which allow it to swing back flat against the pen when open.

The gate is fitted with an extra heavy spring lock. It locks automatically and cannot possibly be opened by accident. The gate opening is 3 feet 3 inches wide.

Stanchions are put into calf pens, as desired.

By means of a continuous locking bar they can all be opened or closed at one time; or opened and closed separately, as desired. This bar and all connections are below the top rail.

Feed guards of heavy galvanized steel are so arranged that they can be raised when the manger trough is to be cleaned. These feed guards prevent the calves forming the habit of chewing or sucking each other's ears.

Star Steel Calf Pen can be made in panels or sections of any desired length, finished in gray enamel.

Gate fittings for Star Steel Calf Pen include double arch, hinges and automatic safety lock. Star Steel Calf Pen may be fitted with stanchions spaced either 15, 20 or 25 inches apart on center. Star Steel Calf Pen, height, 3 feet 9 inches from floor; finished in gray enamel; weight, per foot, 15 lbs. Star Feed Guards for Calf Pen, finished in gray enamel; weight, each, 20 lbs.



STAR Equipped Calf Barn on Wheatfield Farms
Owned by J. C. Dold, Buffalo, N. Y.

SOUTH BRANCH RANCH COMPANY
W. E. WOOD, PRESIDENT

OFFICE:
1805 FORD BUILDING
DETROIT, MICHIGAN

LANDS:
CRAWFORD COUNTY, MICH

DETROIT, MICH. July 22, 1918

Hunt-Helm-Ferris Co.
Harvard. Illinois.

Gentlemen:-

I wish to take this occasion to express my pleasure at the results of the installation of your Star stalls, stanchions, pen equipment, etc., in my six Barns of the South Branch Ranch Company, Roscommon, Michigan. It is the best equipment, in my opinion, that could possibly be installed and is giving excellent results in every respect, and I take pleasure in recommending highly the installation of your equipment to any one who contemplates barn installation, especially for cattle stanchions, bull, cow and calf pens.

I contemplate extensive additions to my principal cow barn this fall and will certainly use your equipment in same.

Yours very truly,

WEW:E

W. E. Wood.



No. 813 Star Steel Young-Stock Pen

NO barn is properly equipped unless provision has been made for the proper housing of the young stock.

STAR Steel Young-Stock Pen was designed to take care of large calves, yearlings, or even full grown cows. This pen is built the same height as STAR Steel Cow Pen. The top and bottom rails are made of 1½ inch square steel tubing into which the ends of the upright bars are inserted. The upright bars are made of 1⅛ inch O. D. steel pipe, new and tested, and are spaced 5 inches apart on centers. One-half inch tie rods extending through the uprights bind the panels together as rigidly as though they were made of one piece. It has smooth top and bottom railing, free from clamps, and is easy to clean and to keep clean.

Stanchions are spaced 30 inches apart on centers, unless otherwise specified. While these stanchions are intended primarily for young stock they are plenty strong and heavy enough for full grown cows. The uprights are made of 1 5/16 inch by ⅞ inch high carbon steel U-bars attached to the top and bottom railings by malleable clamps arranged to provide for an adjustment in neck space to accommodate any size animal.

The STAR Steel Young-Stock Pen is built in panels as illustrated. As it is identical with STAR Steel Cow Pen described and illustrated on the preceding pages, it is furnished made to order and can be fitted with the same double arched gates.

Each panel or section is assembled at the factory. Only the corner posts and legs of the gate arch are imbedded in concrete, so the installation is simple and easy.

When ordering, or writing for quotation, send along a rough sketch showing the measurements, the location of the gates and specify the number of stanchions required as this construction is built to order.

The STAR Steel Young-Stock Pen is 5 feet high. Finished in gray enamel. Average weight per foot, 20 lbs.

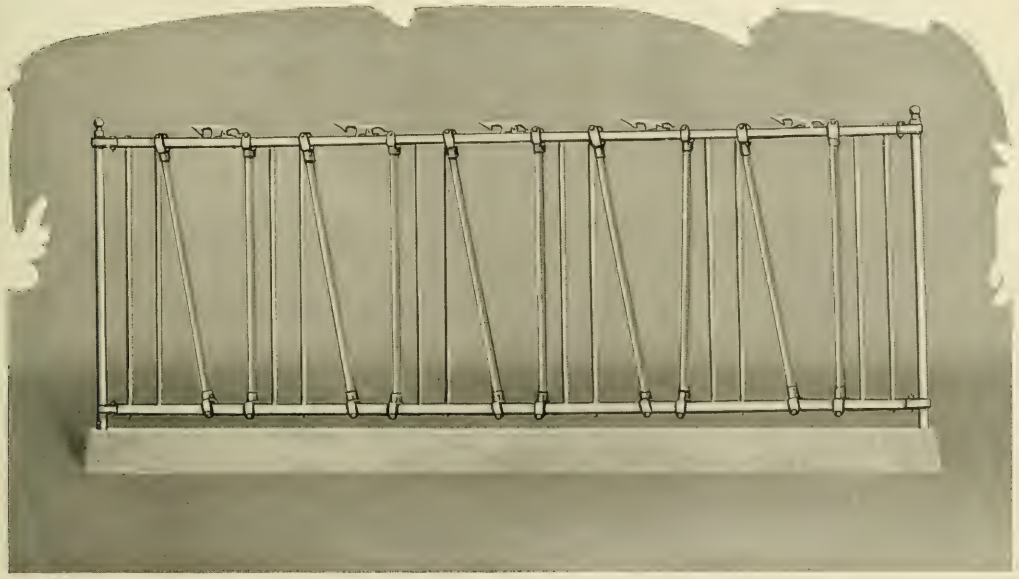


Fig. 813
STAR STEEL YOUNG STOCK PEN

Hunt, Helm, Ferris & Co.,
Harvard, Illinois.

Berkeley, Cal.,
August 1, 1918.

Gentlemen:

Answering your letter of July 19th, we would say that the steel panel work installed in our Hog Cholera Plant has been found very satisfactory and has been an important factor in making it the best equipped plant in the world for this work.

Yours very sincerely, THE CUTTER LABORATORY,
G. M. Twining.

Photographs on opposite page were taken in Hog Cholera Plant of Cutter Laboratories

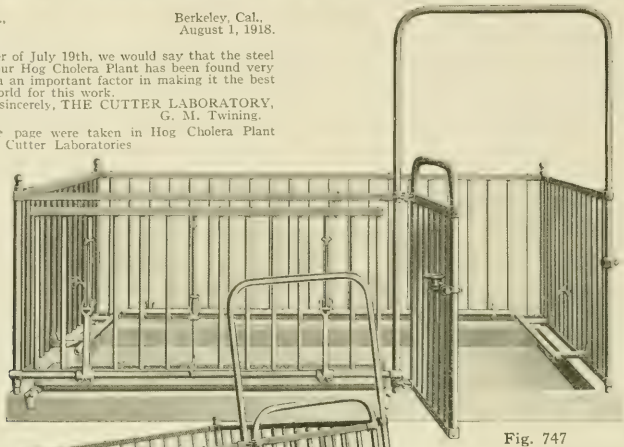


Fig. 747

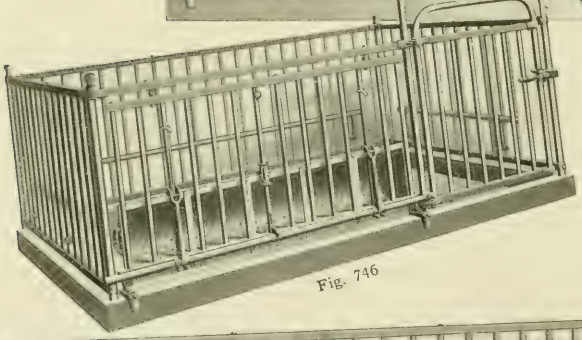


Fig. 746

Fig. 726

STAR STEEL HOG PEN

No. 726 Star Steel Hog Pen

PROMINENT authorities agree that the one way in which Hog Cholera germs can be eliminated is by keeping the hog house clean and admitting plenty of sunshine and fresh air.

After this equipment is once installed, it will quickly return its cost. In the first place, of course, it enables the pens to be easily and quickly cleaned. Owing to the fact that it offers no obstruction to the vision of the hogs it keeps them in a more contented state.

Fumigation and disinfection are really efficient in STAR Steel Hog Pens whereas in wooden structures the character of the material is such as to hold the germs and combat the purpose of the precautionary measures.

On the principle that the early hog is the most profitable, hog-raisers everywhere are now beginning to devote serious attention to the question of properly housing pigs for Winter farrowing so as to prepare them for early pasturage and market.

Labor costs in erecting wooden pens are extremely high. Labor costs in erecting STAR Steel Pens are very low and the difference in installation costs is one of the big arguments in favor of STAR Steel Hog Pens. The Pens are handsomely finished in the usual STAR standard gray enamel and good for a lifetime of service.

The STAR Steel Hog Pens used on the Ohio State Serum Farm, Reynoldsburg, Ohio; C. S. Brantingham's Modern Hog Farm (Mr. Brantingham is president of Emerson-Brantingham Implement Co., at Rockford, Ill.), and many other large money making farms prove the leadership of STAR pen construction.

Extra Strong—Simple Construction

The STAR Steel Hog Pen is strong, sanitary and has few parts. The top and bottom rails are of 1½ inch O. D. square steel tubing. The corner posts and gate arches are of 1⅝ inch O. D. steel pipe. The uprights are 1⅛ inch O. D. steel pipe, regularly set 4 inches apart on center.

The ends of the uprights are inserted into the top and bottom rails, eliminating entirely the use of unsightly and unsanitary clamps and leaving the rails as smooth as a banister.

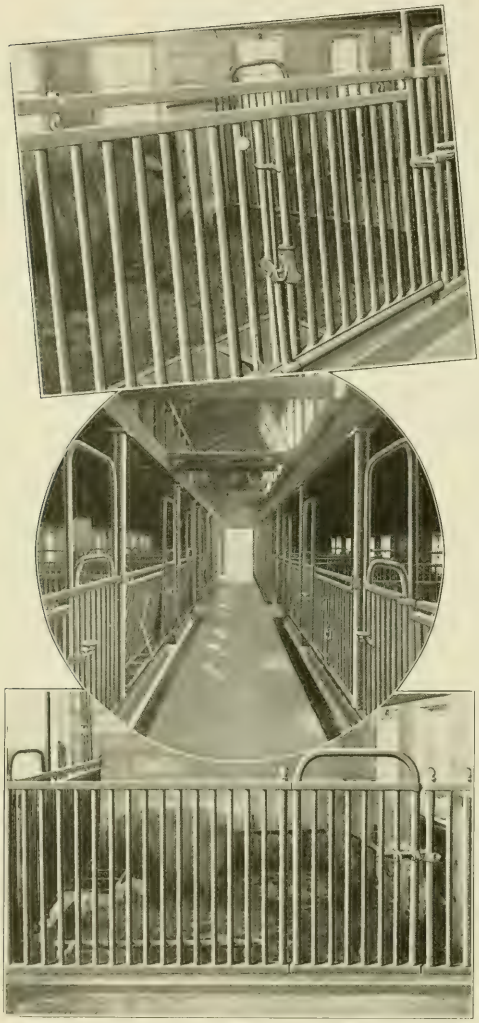
STAR Hog Pens, like Star Bull, Cow and Calf Pens, represent the most sanitary as well as the strongest pen construction yet offered for the reason that there are the fewest possible places for dirt and germs to collect and because the STAR construction provides for the interlinking of all parts in the most substantial manner possible.



Views taken in Hog Cholera Plant of Cutter Laboratories, Berkeley, Cal.

No. 726 Star Steel Hog Pen

(Continued)



Light, Ventilation and Cleanliness are three BIG features in STAR Hog Pens.

Every panel or section is completely assembled at the factory. The corner posts and the legs of the gate arch are all that need to be imbedded in the concrete.

Note Fig. 726 showing how the Hog Pen Panel directly in front of the galvanized steel trough is hinged from the top railing and is movable.

This unique construction permits feeding without the annoyance of trying to keep the hogs away or spilling the feed.

Also note the STAR Pig Stop which fills up the opening left when the movable front is thrown back over the trough. This prevents the small pigs from getting out while the trough is being filled.

A wrought iron hook is furnished with each trough. By inserting this hook between the uprights in the front panel, this trough can be instantly raised and locked up automatically for cleaning. See Fig. 746, page 80.

Double Arch Gate and Farrowing Rail

The STAR Hog Pen Gate (see Fig. 747, page 80), like all STAR gates, is hung on offset hinges, which allow it to swing back flat against the pen when opened. Every gate is fitted with an extra heavy spring lock, which locks automatically. This lock is operated by a round knob and cannot possibly be opened by accident. The arched construction of the gate itself absolutely insures it against sagging. The arch over the gate, which binds the panels together, insures perfect operation of the gate and aligns it accurately.

The Farrowing Rail shown in Fig. 747 prevents the sow from lying too close to the cement curb or pen panel, and affords a means of protection as well as escape for the little pigs.

This Rail, which extends around the pen, is hinged from the pen uprights and during farrowing time is lowered into position. When raised, it is locked automatically and held in place so that it occupies no pen room.

STAR Hog Pens are made up in panels or sections of any desired length. When ordering or requesting quotations, send a rough sketch with measurements.

STAR Steel Hog Pens, uprights 4 inches apart on center, finished in gray enamel.

Average weight per foot, 20 lbs.

No. 748 Star Steel Hog Troughs

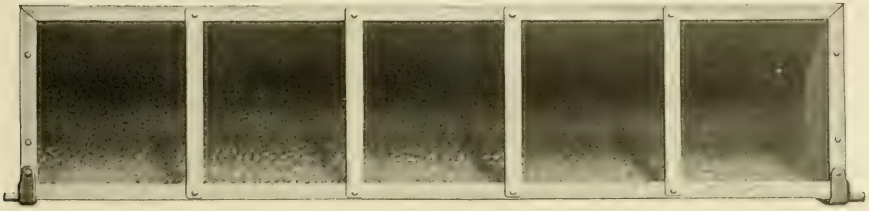


Fig. 748
STAR Hog Trough, Showing Spacing Bars

STAR Hog Troughs are substantially built of 20-gauge steel. After completed they are thoroughly galvanized, which process solders all joints and gives a construction which is not only water tight, but also most durable.

This construction is far superior to troughs made of galvanized iron with soldered joints. The cross-pieces add rigidity to the trough and prevent the hogs from getting into the trough while eating.

Each trough is furnished complete with hinges and clamps for attaching to a four-inch concrete curb. Substantial floor rests are fitted at each end of the trough to support it when in position.

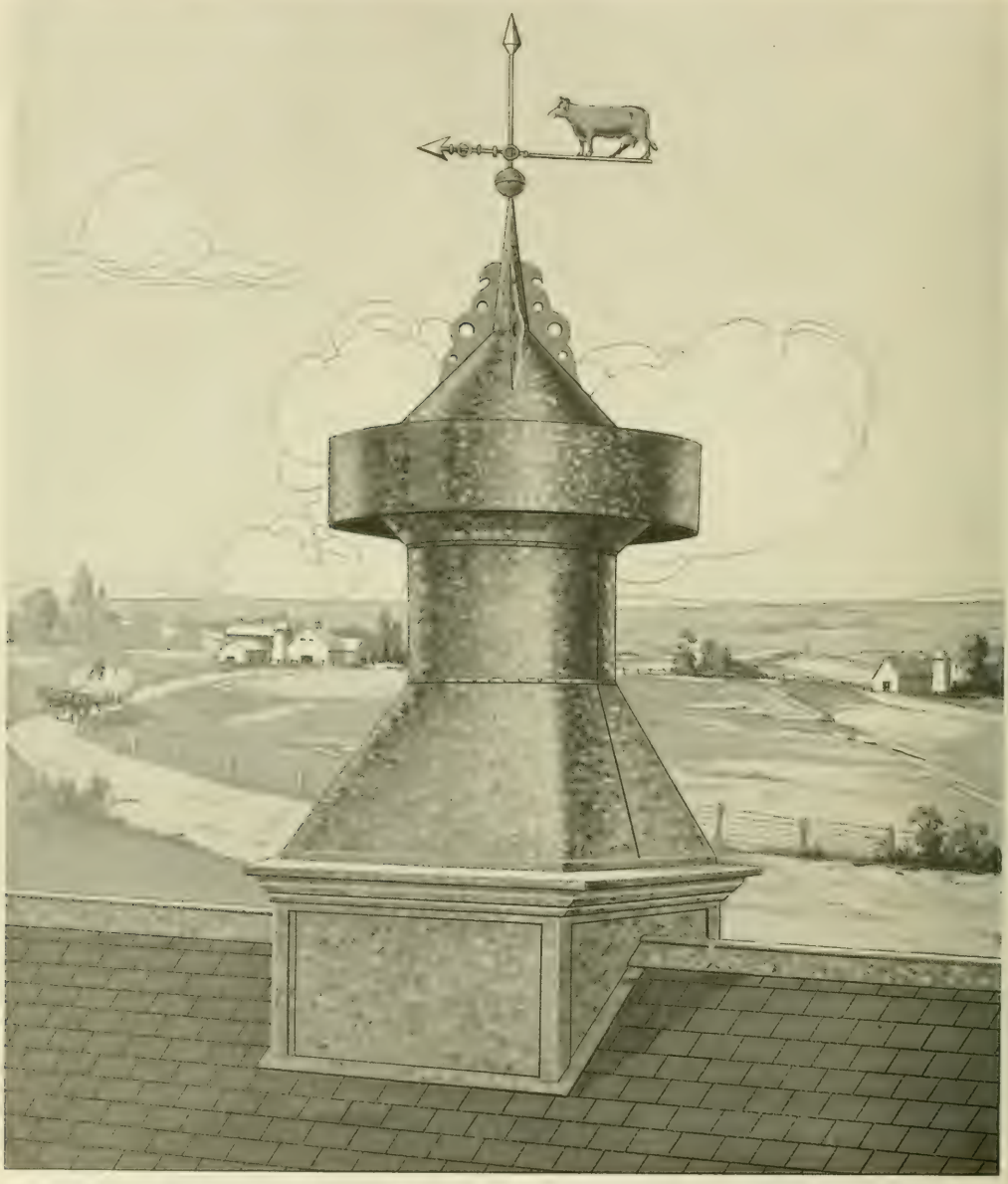
The rounding shape of the bottom renders it sanitary and self-cleaning when raised. This construction permits of no square corners so that it can be flushed conveniently.

STAR Hog Troughs furnished in the following lengths:

4-ft. lengths, weight, each, 40 lbs.
6-ft. lengths, weight, each, 50 lbs.
8-ft. lengths, weight, each, 60 lbs.



Modern Hog Barn Owned by C. S. Brantingham, Rockford, Ill., Designed by Hunt, Helm, Ferris & Co., and Equipped with STAR Steel Hog Pen Construction



STAR STEEL CUPOLA

Star Steel Cupola

NO matter how well a ventilation system is laid out or constructed its value is greatly reduced when the outtake flues are not properly capped. The cupola must have a drawing capacity equal to that of the flues and must be so designed and built as to prevent down-drafts in the hardest wind that blows.

The STAR Steel Cupola not only helps to ventilate the building, but adds beauty to its architecture. Its design matches any style of building.

It is constructed of extra heavy, rust-proof, galvanized steel. Never requires painting, as it is much better to leave galvanized steel in its natural finish.

It is braced at every place where a strain might possibly occur. The braces and stays are strong and substantial and they are galvanized so they won't give out or rust out.

All braces, rods, bolts and nuts being galvanized, will stand long and continued exposure to all kinds of weather.

In the manufacture of the STAR Cupola there is a liberal use of rivets, and wherever any little touch could be added that would contribute to the strength and stability of the cupola, it has been used. No detail which might add to its strength has been omitted.

With all its strength the STAR Cupola is not heavy. It weighs about one-fifth as much as a wooden cupola of similar size.

Lightning Rod Points

STAR cupolas are, upon request, provided with lightning rod points. Be sure to specify this when ordering, as the copper tube and points have to be attached at the time the cupola is built.

Where lightning rod is used, the cable is run along the peak of the roof, under the cupola, to a clamp which is attached to the bottom of the copper tube inside the cupola. This makes a good connection.

An extra charge is made for lightning rod point and clamp.

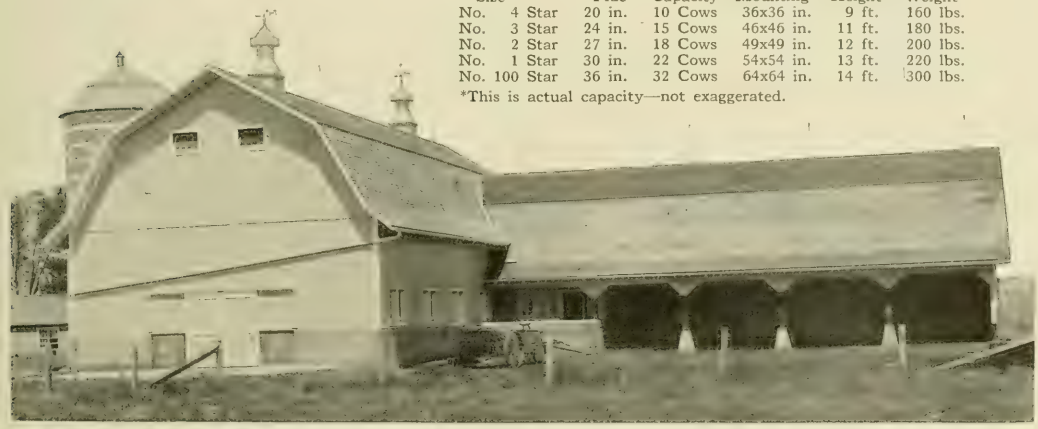
The STAR cupola is easy to install. Any workman capable of using a hammer and wrench can put it up so it will be as strong and secure against damage from wind or weather as any other part of the best built barn.

All STAR Cupolas are furnished with a 24 inch gold leaf weather vane, ornamented with the figure of a cow, horse, hog, sheep, rooster or arrow. Specify choice when ordering.

Sizes of Cupolas

Size	Ventilating Flue	*Capacity	Base Mounting	Height	Shipping Weight
No. 4 Star	20 in.	10 Cows	36x36 in.	9 ft.	160 lbs.
No. 3 Star	24 in.	15 Cows	46x46 in.	11 ft.	180 lbs.
No. 2 Star	27 in.	18 Cows	49x49 in.	12 ft.	200 lbs.
No. 1 Star	30 in.	22 Cows	54x54 in.	13 ft.	220 lbs.
No. 100 Star	36 in.	32 Cows	64x64 in.	14 ft.	300 lbs.

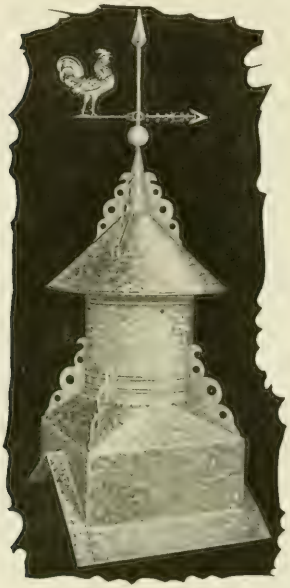
*This is actual capacity—not exaggerated.



STAR Cupolas guarantee the efficiency of the ventilation system and add to the attractiveness of the building.

Star Junior Steel Cupola

ESPECIALLY designed for hen houses, hog houses, milk houses and other small farm buildings where the regular STAR Steel Cupola would be too large for the purposes. It is made of heavy galvanized steel, properly braced and reinforced, and is furnished with a 24-inch gold-leaf weather vane, ornamented with the figure of a hog, sheep, rooster, horse, cow or arrow.



STAR Junior Cupolas are made in three sizes, as follows:

Size	Ventilating Flue	Base Moulding	Height	Shipping Weight
No. 10	20 inch	30x30 inches	8 feet	70 pounds
No. 11	18 inch	27x27 inches	7 feet	60 pounds
No. 12	16 inch	24x24 inches	6 feet	50 pounds

Be sure to specify pitch of roof when ordering STAR Junior Cupolas; or state width of building and length of rafters.

Star Silo Cupola

The STAR Silo Cupola is intended to be used on silos, but it can also be made use of in connection with any other round building.

In construction, it is like the Cupola illustrated above, except that the square base is omitted. It is also furnished with a gold-leaf weather vane.

STAR Silo Cupolas are furnished in sizes as shown below:

Size	Ventilating Flue	Base Moulding	Height	Shipping Weight
No. 16	16 inch	30x30 inches	6 feet	40 pounds
No. 18	18 inch	36x36 inches	6½ feet	50 pounds
No. 22	22 inch	42x42 inches	7 feet	60 pounds

Don't expect the cupolas to accomplish the best results unless your entire Ventilation System is properly planned and built. Do not attempt to lay out a ventilation system until you are familiar with the principles clearly and thoroughly covered in the chapter on ventilation in the Barn Plan Section of this book.

Remember also that our Barn Plan Department can give you the benefit of a very wide experience in solving ventilation problems.



STAR Junior Cupola, Just the Thing for Small Buildings

Star Registers Control the Supply of Fresh Air



Fig. 722
STAR Register Face, for Use Inside the Barn

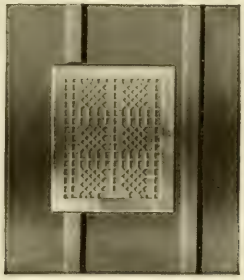


Fig. 741
Outside View STAR Register, Closed

IN STAR Registers we offer a decidedly improved method for regulating the supply of fresh air in connection with air intakes. Ordinary registers are not suitable to use at the outer opening of fresh air intakes because they offer no convenient way of closing off the fresh air when the barn becomes too cold, unless you go outside of the barn and close each register individually. Then, too, it is not practical to regulate the supply of air by closing the inside register for the reason that this leaves the fresh air intake full of cold air with opportunities for condensation and the accumulation of frost on the inner wall and over the cattle, when the intake extends to the center of the barn.

These objections have been absolutely overcome in the STAR Registers. They are operated by closing the outer opening of each fresh air intake by use of the Automatic Shut-off which is illustrated at the right hand side of this page.

No matter how far you may be away from each intake, at a glance you can tell whether it is open or closed. The chains regulating each shut-off hang down, indicating this instantly.

Rain and snow are deflected by the automatic shut-off and kept from lodging in the fresh air intake.

The illustration at the left hand side of this page shows the simple arrangement by which the chain regulating the shut-off is held.

Designed solely for barn use by men who thoroughly understand every detail of barn requirements, this apparatus fills a long felt need.

Star Registers and Register Faces are finished in black japan, thoroughly baked on.

Star Register Face, size twelve by fourteen inches, weight, each, five pounds.

Star Register with Automatic Shut-off, size twelve by fourteen inches, weight each, nine pounds.

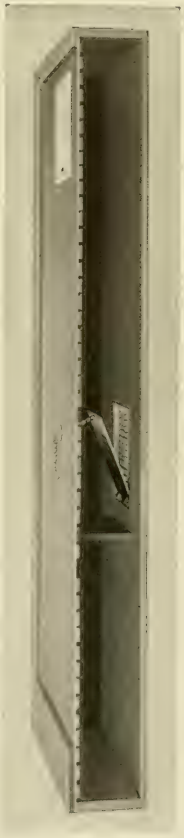


Fig. 723
Section Showing STAR Register with Automatic Shut-off

Star Window Guards Regulate Window Ventilation



Fig. 721
STAR Window Guards Deflect the Fresh Air to the Ceiling

A LITTLE study of the two illustrations of STAR Galvanized Window Guards will reveal one important feature which will make you choose them in preference to all others.

These guards are fitted on the side with a bolt, which has projecting prongs.

These prongs enable you to lock the window open as far as desired.

If you want a little air, the bolt will hold the window in such a position that you get the desired amount. If you want a lot of air, the same thing holds true. In other words, window ventilation is absolutely under your control when you are equipped with STAR Window Guards.

Star Window Guards are furnished galvanized, weight, per set, 5 lbs.

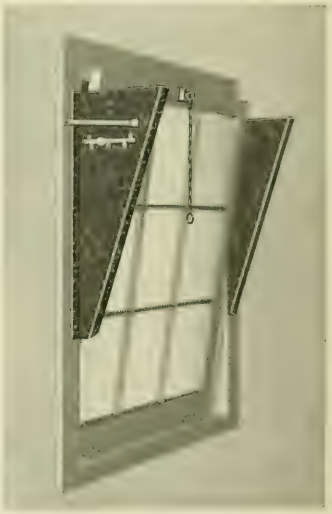


Fig. 740
STAR Window Guards Hold each Window Open any Distance Desired

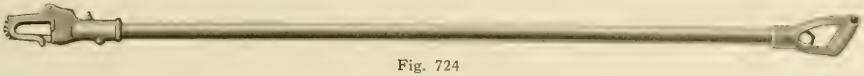


Fig. 724

No. 724 Star Steel Bull Staff



Fig. 817

USE a STAR Steel Bull Staff and be protected against accidents when handling the bull. Every good feature found in any Bull Staff, together with exclusive STAR advantages, are found in our product.

The STAR Bull Staff can be operated from two places. When hooking the staff into the bull ring, the snap can be opened from the hook end. When releasing the staff from the bull ring, the snap on the hook can be opened from the handle end.

It gives perfect control over the bull in the same manner, only more efficiently, than a Curb Bit handles a horse.

A pressure of the staff against the animal's nose or a slight turning of it, keeps him well under control at all times, no matter where you are standing.

The STAR Bull Staff is 5 ft. in length.

The hook and handle are constructed of very best malleable iron, while the staff itself is made of 1-inch steel pipe and is absolutely and positively indestructible.

Finished in gray enamel, thoroughly baked on.

The weight is 10 lbs.



Fig. 818
The STAR Bull Staff is operated as illustrated or by the chain extending through the staff from hook to handle



Fig. 725

No. 725 Star Sanitary Milk Stool

THIS is one of the little things around the barn that comes in mighty handy. It is sturdy, and secure in its footing, and so durable in construction that it should last practically forever.

The Star Milk Stool has a wooden seat reinforced around the edges by an electrically welded steel rim, having smooth, rolled edges. This construction absolutely cannot warp.

The Star Milk Stool combines the comfort of the wooden seat with a steel construction that is sanitary and easily kept clean.

The Star Milk Stool is finished in gray enamel.

Weight, each, 6 lbs.

Star Gray Enamel

Here is an enamel that will protect metal from rust and barn conditions. It is exactly the same composition that we use on STAR Equipment and has been thoroughly tested out for several years under the most trying conditions possible with the result that it has been found to give *lasting service.* It is rust-resisting and withstands ammonia and gasses found in a dairy barn.

It is elastic enough to take care of the expansion and contraction of the steel on which you use it without cracking or chipping.

We can positively recommend this enamel as the most satisfactory finish for protecting metal surfaces of any character around the dairy barn.

Furnished in one-half pint, pint, quart and gallon cans.

Weight, per gallon, 12 lbs.



Fig. 759



Fig. 637

No. 637 Star Manger Drain

An Absolute Necessity in every Sanitary Barn. If the mangers of the dairy barn are made of cement, they should be equipped with Star Manger Drains. Every floor that is flushed with water, should be so built that the water is carried off through a Star Drain.

The body is of cast iron. Ordinary drains have iron or brass caps that rust and corrode, causing them to stick. The cap of the Star Drain is made of aluminum, a metal that doesn't corrode or rust, and is machined to make a close fitting joint.

The Star Manger Drain complete, 4 inches in diameter, weighs 5½ lbs.

No. 831 The Star Floor Scraper

HERE is a big work saver in cleaning the barn floor. Every barn owner wants one. It's exactly what you want in *your* barn.

It is made with a blade of heavy high-carbon steel firmly attached to a long, well balanced handle. The handle socket and braces are made of the best grade of malleable iron.

The STAR Floor Scraper will last twice as long as the ordinary scraper. The steel blade is reversible. After one edge has become worn down, remove the blade, tip it over, attach it to the handle and you have a new scraper. You really have two scrapers in one.

Handle is varnished; blade painted black. Weight, each, 9 lbs. Furnished either 15 or 24 inches wide.

You will find the STAR Scraper especially convenient for cleaning off the approach to the barn door. A might handy tool in clearing away snow in winter time.

Extra blades for STAR Scrapers can be furnished if desired.



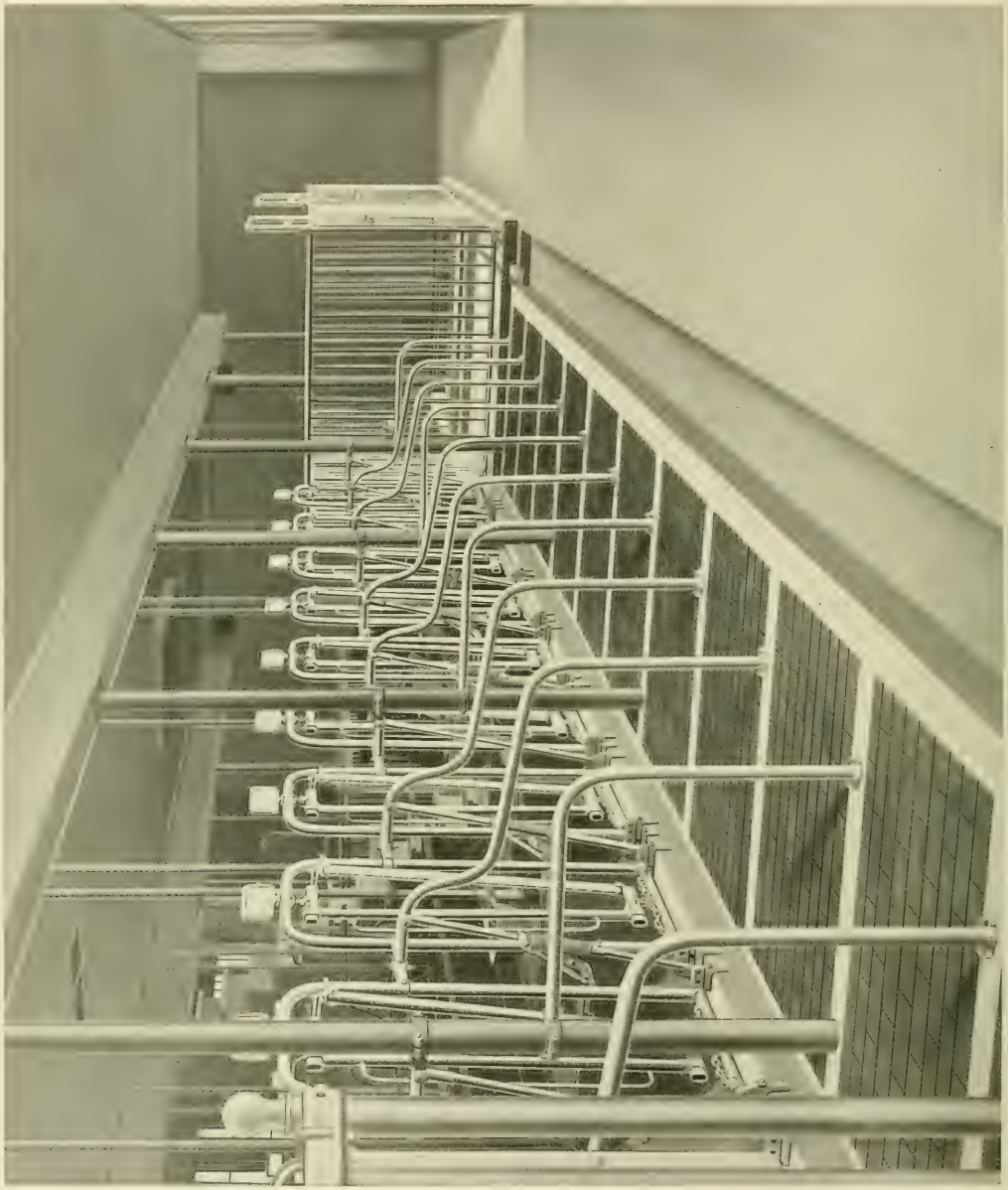
Fig. 831 STAR Floor Scraper



For cleaning the floors of your barn, you will find nothing so convenient as the STAR Floor Scraper. It is especially adapted to cleaning the gutters, too.

It is also handy for cleaning sidewalks or streets or any place where a scraper is used. Made in two sizes, 15 and 24 inches in width.





Unit System STAR Stalls and Cork Brick in Use in the Dairy Barn at the Oneida Indian School, Oneida, Wisconsin

Cork Brick



Fig. 638

TO the man who has the comfort of his cows at heart, Cork Brick offers the ideal dairy barn floor. It is warm, easy on the feet, and perfectly sanitary. It combines the good qualities of both wood and cement.

Cork Brick is made of particles of cork held together by refined asphalt, and moulded into bricks four inches by nine inches by two inches thick.

They are waterproof and non-absorbent.

Cork Brick wears remarkably well and is easy to install. The bricks are laid one-eighth of an inch apart and the cracks thus left are filled in with Portland cement.

The floor problem is a serious one. Wood is fairly warm and easy on the feet but soon gets foul and rots out, and is not sanitary at any time.

Standing or lying on the cold, hard surface of concrete is so injurious to the stock that it more than offsets the easy-to-keep-clean qualities of this material. Cork Brick is the modern solution. It offers all of the following advantages that are essential to a successful floor:

(1) Sanitary—
(2) Warm to the touch—
(3) Easy under foot—
(4) Noiseless—
(5) Never slippery—
(6) Durable in service—
(7) Extremely easy to install—

The number of years that Cork Brick has been in use and the hundreds of installations in all parts of the country proves beyond all question its practicability.

Size of Cork Brick is nine inches by four inches by two inches.

The bricks are laid flat and four will cover exactly one square foot of surface.

Weight of Cork Brick is 2½ pounds each.

Nine thousand six hundred bricks make a minimum carload of 24,000 pounds. Small lots must be crated.

Samples furnished on request.



Fig. 760
STAR HORSE STALL
Fitted with STAR Stall Front, Automatic Hay Rack, Sanitary Feed Manger and Steel Stall Guards

Star Automatic Steel Hay Rack

THE old way of feeding permitted great wastes of hay, and insanitary conditions where the hay was placed in an enclosed manger or thrown upon the floor.

You will never realize the quantity you have heretofore wasted until you install Automatic Steel Hay Racks.

An opening and closing device on this rack permits of its being instantly locked open so that it can be quickly filled. It is then released and the front closes automatically.

An even tension is maintained which permits of the animal feeding right down to the last spear of the hay without a particle being wasted.

Simplicity of construction is the keynote of all STAR Equipment and this is no exception when applied to the Automatic Hay Rack. It is so simple that it is never out of order and besides is extremely durable. There are no sharp corners to injure an animal, and once installed, it is a lifetime fixture.

As a result of animals scattering hay around the stall when it is fed from floor or open manger, a waste of from three to five pounds of hay a day is a very conservative estimate. If you will take a pencil and paper and figure out what this three to five pounds per day per animal totals up at the end of the year, your own figures will be the best possible argument we can advance in favor of immediate installation of the Automatic Steel Hay Rack.

The saving in stall room and floor space is obvious and is a big item in many crowded barns.

From a sanitary standpoint, the steel construction permits of easy and effective fumigation should it be desired. Furthermore, it is self-cleaning and does away entirely with the eating of trampled, dirty, unfit feed.

On the opposite page we have reproduced from an actual photograph, one stall in the modern horse stable of C. S. Brantingham, of Rockford, Illinois. This stable was designed by us and equipped throughout with Automatic Hay Racks, Sanitary Feed Mangers, Steel Stall Guards and Stall Posts.

Our Architectural Department is always ready to help you solve your barn problems.





Fig. 761

STAR HORSE STALL

Fitted with Open Back Automatic Hay Rack, Sanitary Feed Manger and Steel Stall Guards

Star Automatic Steel Hay Rack

(Continued)

AUTOMATIC HAY RACKS are designed to meet all requirements whether the hay be fed from the front alleyway, from the rear of the stall, or from the loft.

The complete stall illustrated on page 94, shows the ideal hay rack construction to be used for front alleyway feeding.

The illustration opposite brings out most forcibly the practicability of the Automatic Steel Hay Rack for feeding from the rear of the stall or from the loft.

The main frame work is constructed of 1 in. x 1 in. high carbon steel angles. The corners are formed rounding and are re-inforced by steel plates. The frame being also braced by angle iron cross bars and upright rods, cannot possibly be drawn out of shape. This construction is neat in appearance and sanitary and has the strength and rigidity to withstand rough usage.

Every rack is fitted with two special tortion coil springs, which form the hinges upon which the rack operates. These springs are 2 5-16 inches of 3-8 inch steel and are especially adapted for use with the Automatic Steel Hay Racks illustrated.

Great care is taken in tempering these springs to secure the proper tension and to eliminate all possibility of breakage. Being tested before shipment, every spring is guaranteed against defect or breakage.

The locking device used on these hay racks consists of two $1\frac{1}{4}$ inch steel side arms operating in links at each end of a continuous piece of cold rolled shafting attached to the cross bars of the frame. These links, which work the side arms in unison, operate in a complete half circle, allowing the rack to be locked open for filling when below a central point and completely closed when raised.



As the hay is consumed by the animal, the front moves to a closed position, keeping the hay always within reach of the animal, and when entirely closed occupies a space of but three inches.

The rods through which the animal feeds are spaced 6 inches apart on center. These rods extend through the angle iron cross bars and are electrically welded at the ends so that they cannot possibly become detached.

The pages which follow explain clearly how to order the construction best suited to your requirements.

Star Stall Front Used with Automatic Hay Rack

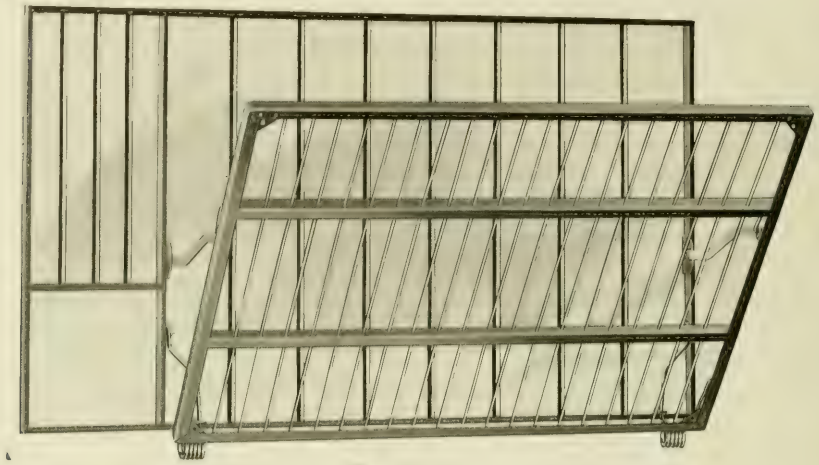


Fig. 749

STAR Stall Front with Automatic Hay Rack locked open, as it appears from front feeding alley

THE Star Stall Front is designed for front alleyway feeding. It fills the entire opening or stall front, fitting in neatly between the front stall posts. This construction is designed to do away with all wooden parts, as the stall front itself supports the Automatic Hay Rack and fills the entire opening with the exception of the space through which the grain is fed from the front alley.

The upright rods are spaced 6 inches apart on center, so that the horse can reach the hay easily; at the same time the automatic front constantly holds the hay under pressure, keeping it within easy reach and at the same time prevents its being pulled out in bunches and wasted.

The front of the rack is locked open to be filled and then released so that it occupies, even when full of hay, very little alley room.

The saving in hay alone, without considering any of the other good features of this rack, will pay the initial cost of installation in six months' time.

When ordering, it is only necessary to specify the exact space in between the wooden posts to which the Star Stall Front is to be attached.

The Star Stall Front with Automatic Hay Rack combined, is assembled before shipment and is nicely finished in black japan.

Weight, each, complete, 110 lbs.

Star Automatic Steel Hay Rack

(Open Back Construction)

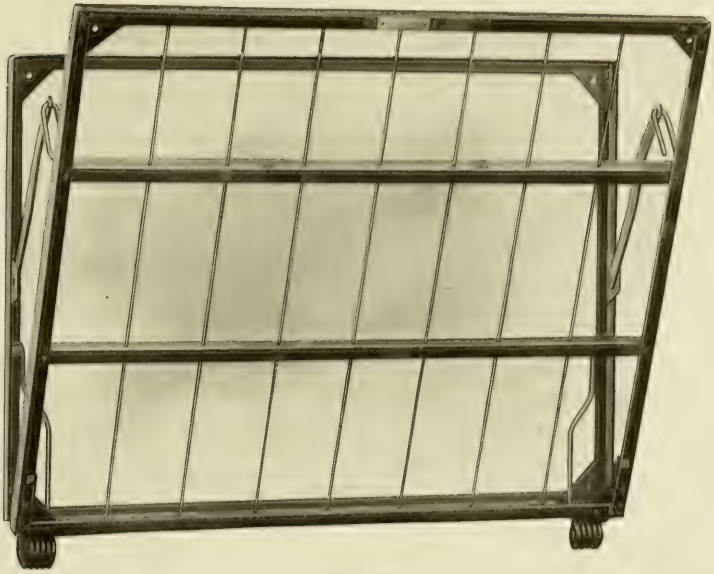


Fig. 750
STAR Automatic Steel Hay Rack, Fitted with Open Back, 30 Inches High

THE Automatic Hay Rack, with open back construction, as shown in above illustration, should be specified when it is to be attached to the walls of the barn. The upright wiring in the back of the rack is omitted so that the hay will not accumulate between the wall and the back of the rack.

This construction is desirable when the hay is to be fed from the rear of the stall or from the loft. The operation of the front of the rack through which the animal feeds is the same as that described on page 98.

We show below a list which comprises the various sizes of racks which we furnish in black japan, with either the 30-inch open back construction, or with the upright wiring in the back, when so specified.

	Height	Width	Weight each
No. 1 Standard	36 in.	42 in.	40 lbs.
No. 2 Standard	36 in.	48 in.	45 lbs.
No. 3 Special	36 in.	36 in.	37 lbs.
No. 4 Special	42 in.	36 in.	41 lbs.
No. 5 Special	30 in.	54 in.	44 lbs.
No. 6 Special	36 in.	72 in.	74 lbs.

Star Sanitary Feed Mangers



Fig. 755
STAR Sanitary Feed Manger (Showing Position When Tilted)

THE Sanitary Feed Mangers illustrated on this page are constructed of 18-gauge, refined, cold rolled steel, heavily reinforced. Being formed without rivets and galvanized after being made up, they are water tight and indestructible.

The shape of the manger itself, all corners being rounded, makes it self-cleaning.

Every manger is pivoted in a heavy one and one-half inch steel frame so that it may be completely turned over before each feeding, in this way permitting absolute riddance of dirt, sour feed, or refuse, before fresh grain is placed in it.

The frame in which this manger is set may be easily attached to walls of any material by heavy lags or bolts. The back of this frame and one end is secured to the stall, while an extra heavy brace supports the unfastened end.

All Sanitary Feed Mangers are equipped with cross bars which prevent the waste of feed and which act as a check on too rapid eaters. Entirely apart from the sanitary features of this feed manger, the fact that its use means a saving of from ten to fifteen per cent of the grain fed is a strong argument in favor of its installation.

Furnished, galvanized, in the following sizes:

	Length	Width	Depth	Weight each
No. 1	20 in.	12 in.	7 in.	20 lbs.
No. 2	20 in.	13 in.	9 in.	22 lbs.
No. 3	14 in.	12 in.	7 in.	14 lbs.



Fig. 756
STAR Sanitary Feed Manger (Showing Cross-bars Which Prevent Waste of Feed)



Fig. 757
STAR Sanitary Feed Manger Can be Quickly Cleaned Before Filling

Star Steel Stall Guards

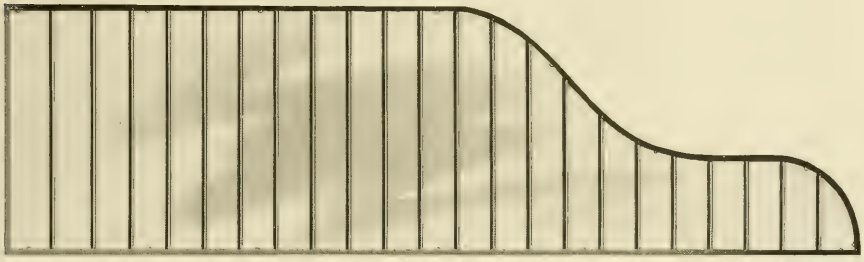


Fig. 742

Star Wrought Steel Stall Guard, with Rounded End

THE Star Wrought Steel Guard illustrated above allows free circulation of air, plenty of light and at the same time keeps the animals apart. With this construction, the hames or other parts of the harness are not apt to catch.

The uprights of one-half inch round steel are set three and one-half inches apart on center in a one and one-quarter inch by one-half inch channel steel frame. A plate is placed upon the top rail to cover the channel and prevent accumulations.

Star Wrought Steel Guards, height two feet, are furnished in black Japan in the following lengths: five, six, seven, eight and nine-foot.

Average weight, per foot, six lbs.

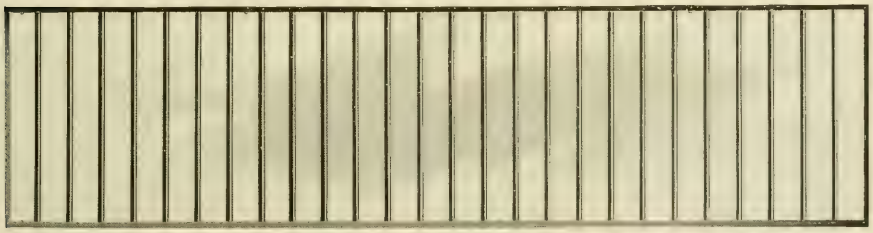


Fig. 743

Star Wrought Steel Stall Guard, with Square End

The Star Stall Guard illustrated above is suitable for use in connection with either single or box stalls. These guards are furnished two feet high, in any length desired.

The uprights are of one-half inch round steel and set three and one-half inches apart on center, in one and one-quarter inch by one-half inch channel steel frames.

Specify exact length desired.

Finished in black Japan.

Average weight, per foot, six lbs.

Star Stable Fittings

Star Stall Posts

STAR Stall Posts are constructed of four-inch, heavy wrought steel tubing to which are attached heavy steel channels---size, two inches by one and three-quarter inches, three-sixteenths of an inch in thickness. These channels are attached to the Stall Posts by countersunk set screws in a substantial manner. The back of each channel is rounded to conform to the rounding shape of the stall post. This gives a neat and sanitary construction.

The Figure 732 Star Stall Post is used where it is not necessary to support the loft above. This post is five feet six inches over all, not including ornamental ball. Sixteen inches of this post are intended to extend below the floor line to provide a firm and secure anchorage in the concrete.

The four-foot channel receives the four nine-foot planks of two-inch dressed lumber which form the stall partition. These planks should be connected by dowel pins to keep them in line and to prevent warping.



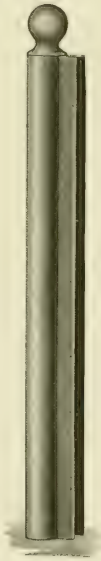


Fig. 733 Fig. 732
STAR Stall Posts

The Stall Post itself is nicely finished off with a suitable cast iron ornamental ball.

Where the stall posts extend to ceiling we furnish regular four-inch supporting columns, as illustrated and described on page 68, with either four-foot or six-foot channels attached as shown in Fig. 733. These channels are the same size and are attached in the same manner as those furnished in connection with our Fig. 732 Star Stall Post.

All Stall Posts finished in gray enamel thoroughly baked on. Fig. 732 Star Stall Post, complete as illustrated, weight each fifty pounds; four-foot channels two inches by one and three-quarter inches by three-sixteenths of an inch, weight each thirteen pounds; six-foot channels two inches by one and three-quarter inches by three-sixteenths of an inch, weight, each, twenty pounds.



Fig. 729
STAR Harness Hooks



Fig. 730
STAR Harness Hook to attach to 4-inch Stall Post

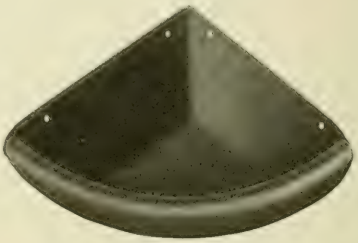


Fig. 731
STAR Corner Feed Manger

Star Harness Hooks

Star Harness Hooks, as illustrated in Fig. 729, are made of cast iron, extra heavy and serviceable, nicely finished in black Japan, three sizes as follows: thirteen-inch Star Harness Hooks, weight per doz. eighty-four pounds; ten-inch Star Harness Hooks, weight, per doz., sixty pounds; eight-inch Star Harness Hooks, weight, per doz., thirty-six pounds.

The Fig. 730 Star Harness Hook is built to attach to four-inch Star Stall posts by means of the malleable clamp shown. This harness hook is furnished nicely finished in gray enamel to match Stall Post. Weight, each, four pounds.

Star Corner Feed Manger

The Star Corner Feed Manger, shown in Fig. 731, is made of cast iron—standard size is nine inches deep by seventeen inches by seventeen inches. The front edge is neatly rolled and flanged; furnished in one size only; finish black Japan; weight, each, thirty pounds.

No. 744 The Self-Acting Oats Cleaner



Fig. 744

IN every twenty-five to thirty bushels of oats you will find one bushel of dirt and other foreign matter. The Self-Acting Oats Cleaner is positively guaranteed to remove one bushel of dirt and other foreign matter from every twenty-five to thirty bushels of oats that passes through it.

The above guarantee finally answers all questions as to the efficiency of this Oats Cleaner. As to its durability, judge for yourself. The material is kiln-dried white wood with two protective coats of varnish and the entire job built by hand.

This method of oats cleaning has made the old way of running the oats down a single set of screens obsolete. In the Self-Acting Oats Cleaner there are eleven slanting screens, operating in pairs; a table elevated in the center is located below each pair of screens, so that the oats fall from screen to table, from table to screen, and from screen to table, thus dividing the oats and giving them a very rapid impetus as they pass from each set of screens. Below the operating valve which is in the top of the cleaner, is a large, coarse grate which throws off stones, sticks and other coarse accumulations.

The dirt box in the base of the cleaner and a hand hole in the bottom makes it easy to clean.

Specify whether right or left hand side discharge of oats (facing the cleaner) is desired, when ordering.

If special finish to correspond with the stable is desired, specify when ordering.

Self-acting Oats Cleaners are furnished in the following sizes:

No. 1. 6 ft. 3 in. long, 8½ x 15 in. Capacity ½ bu. per minute. Weight, each, 65 lbs.

No. 2. 6 ft. 3 in. long, 11 x 16 in. Capacity, 1 bushel per minute. Weight, each, 80 lbs.

No. 3. 6 ft. 3 in. long, 12 x 16 in. Capacity 2 bushels per minute. Weight, each, 82 lbs.

No. 745 Star Sanitary Watering Trough

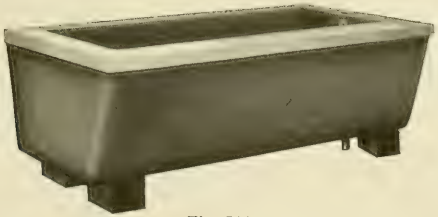


Fig. 745

THE Water Trough illustrated above is made of waterproof concrete, cast in one piece and equipped with waste connections and overflow. Practically everlasting and guaranteed for ten years. In three stock sizes, specials to order.

SIZE "A" STAR SANITARY WATERING TROUGH—30 in. long, 28 in. wide, 16 in. deep; weight, 400 lbs.

SIZE "B" STAR SANITARY WATERING TROUGH—44 in. long, 28 in. wide, 16 in. deep; weight, 500 lbs.

SIZE "C" STAR SANITARY WATERING TROUGH—52 in. long, 28 in. wide, 26 in. deep; weight, 600 lbs.

Directions for Ordering Star Steel Stalls and Stanchions, Pens and Accessories

PRACTICALLY all we need to know to supply your needs is the style of stalls you have decided upon, how wide they are to be, 3 feet, 3 feet 3 inches, or 3 feet 6 inches, or any other desired width, and the number you want.

However, in making up your orders, it is well to observe the following general rules and thereby avoid the possibility of unnecessary correspondence and delay.

1. Specify number of stalls wanted and tell how many rows there will be. An extra partition will be needed at the end of each row of stalls.

2. Specify the style of stall wanted, stating whether to be used with or without steel supporting columns.

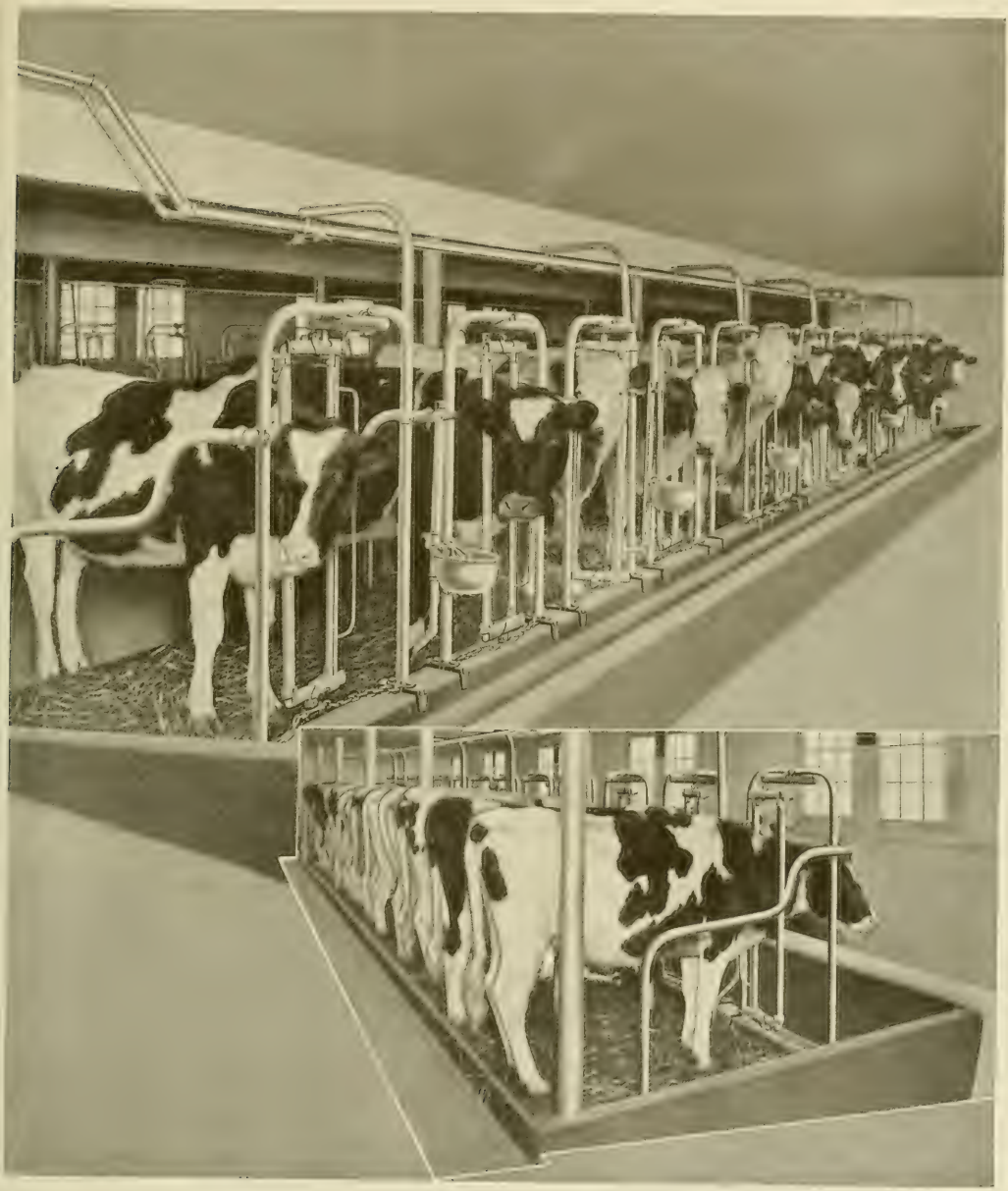
3. If steel supporting columns are ordered with stalls, be sure to specify the length over all, including thickness of caps and bases, also the outside diameter of the columns wanted. If stalls are to be placed in line with, or between, either wooden or steel supporting columns, specify the exact distance between the columns from center to center and the exact size of the columns.

4. Specify width of stalls (3 feet; 3 feet 3 inches; 3 feet 6 inches.)

5. If stanchions are ordered separately specify whether these are to be hung single chain top and bottom, swivel top and bottom, or whether they are to be fastened with swivel at top and double chain at bottom.

In ordering pens, the essential thing is to measure accurately the length of each section or panel and to specify the position of gates, stanchions, mangers and racks.

Where the arrangement of the barn has already been decided upon, it is a simple matter to figure out according to the above what equipment is necessary. But *if there are any special conditions to be met, or if any suggestions relative to the arrangement of the barn are desired, just write us, enclosing a rough sketch of the barn.* Your sketch will be redrawn to scale and a blue print sent to you, in order that you may check up the blue print with the actual conditions, so that there can be no possible misunderstanding on our part in filling your order.



Photographs taken in one of the STAR Test Barns. Note how STAR Alignment Device keeps every cow in line at the gutter.



STAR Equipped Dairy Barn at the Famous Meadow Bro
L. H. Turner, Pittsburgh, P



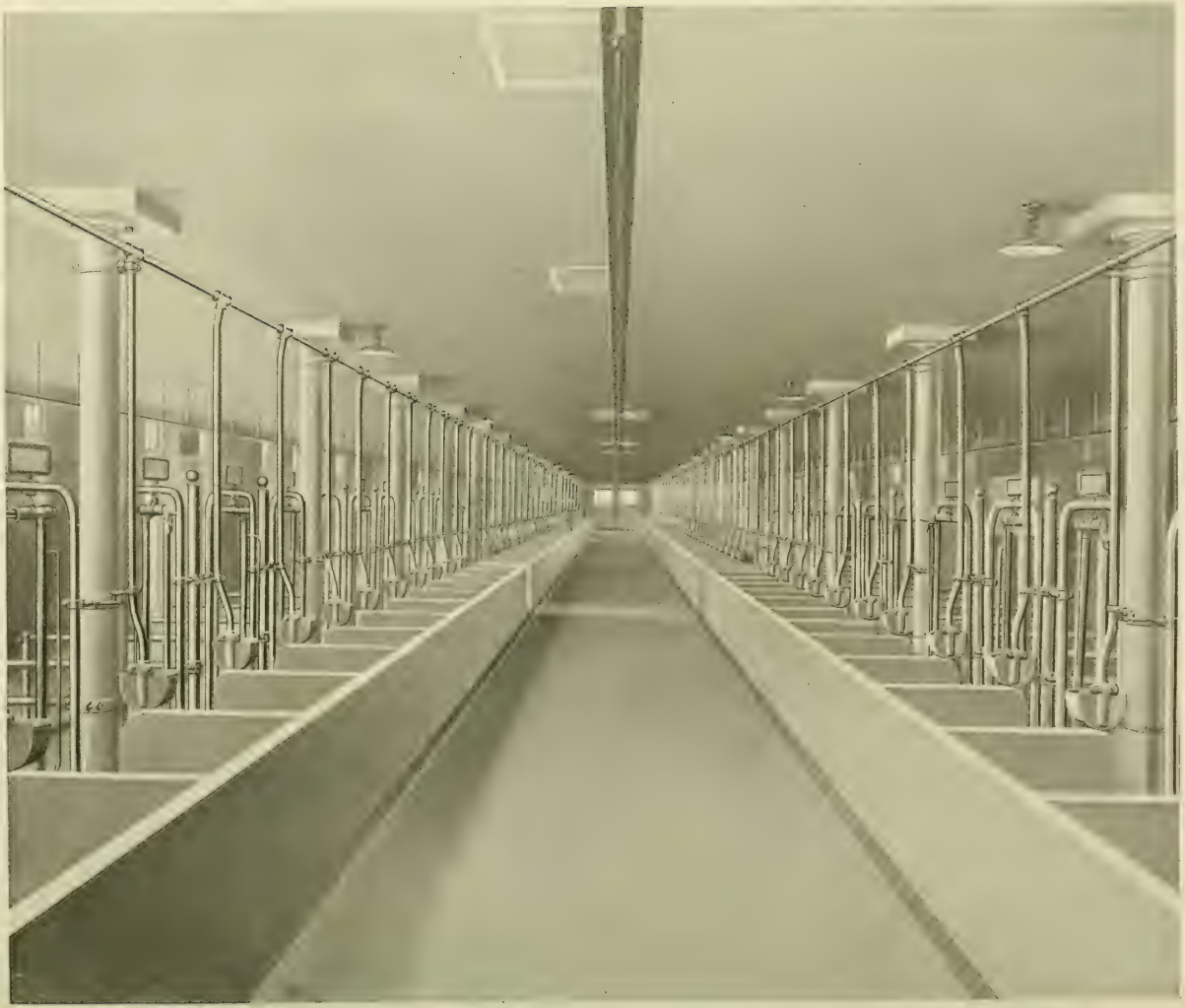
n, Leavittsburg, Ohio, Where Certified Milk is Produced.
er; R. H. Turner, Manager



STAR Equipped Dairy Buildings, Wabeek Farms, Pont



nigan. Owner, James Couzens, Mayor of Detroit, Michigan

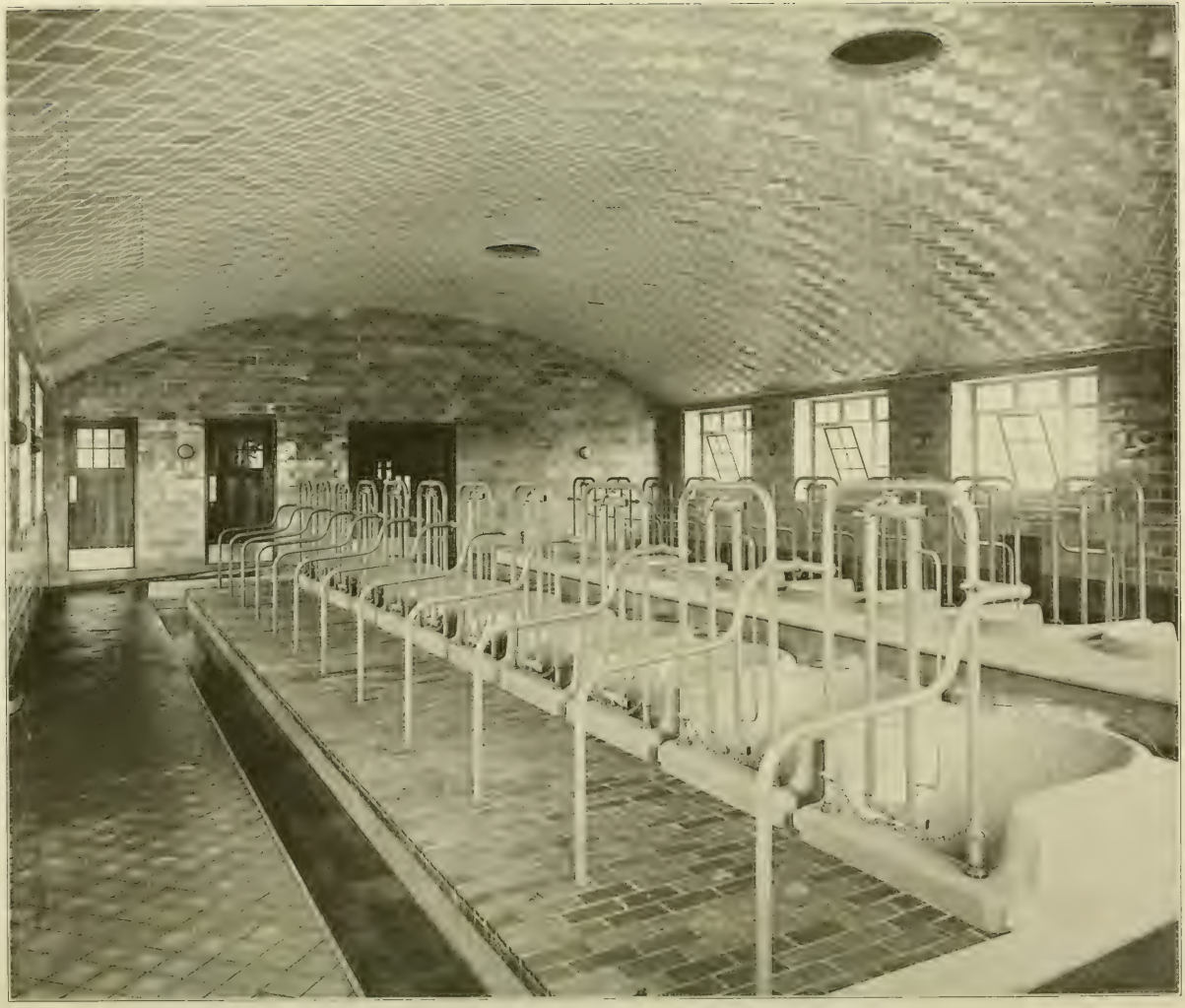


STAR Equipped Dairy Building, Wabeek Farm, Pontiac, Michigan, Costing over $150,000.00, is, in the words of Mr. L. H. Barnum, Supt., "The most extensive arrangement since cows were kept in barns"



STAR Equipped Dairy Barn of Cudahy Brothers Co., Cudahy, Wis., One of the Finest in the State

STAR LINE EQUIPMENT



HUNT · HELM · FERRIS & CO ·

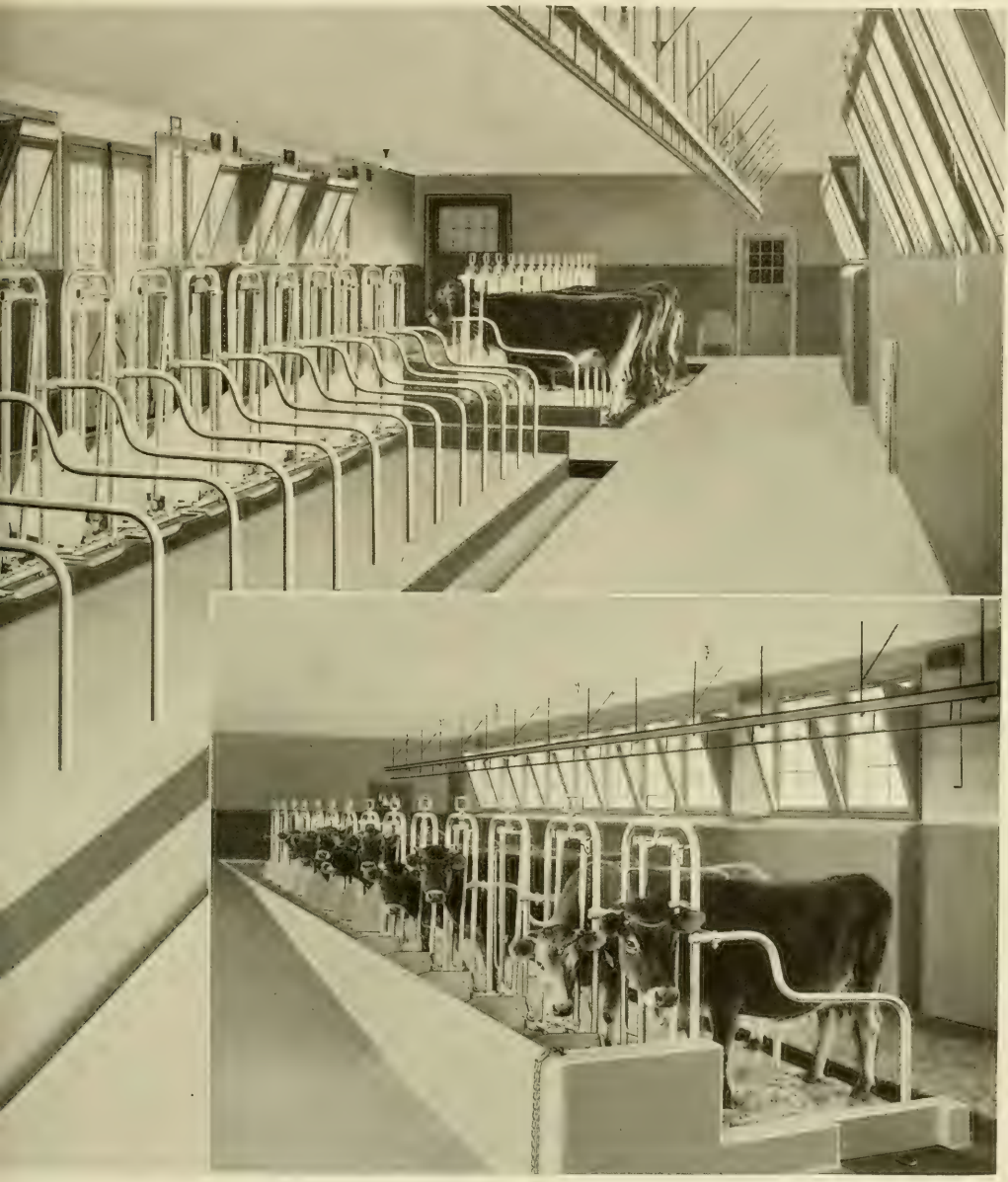
STAR Equipment Barn, at Rhinebeck, N. Y., owned by Vincent Astor



STAR Equipped Pen Department, Barn of O. C. Barber, Barberton, Ohio, Equipped with 150 Individual STAR Pens



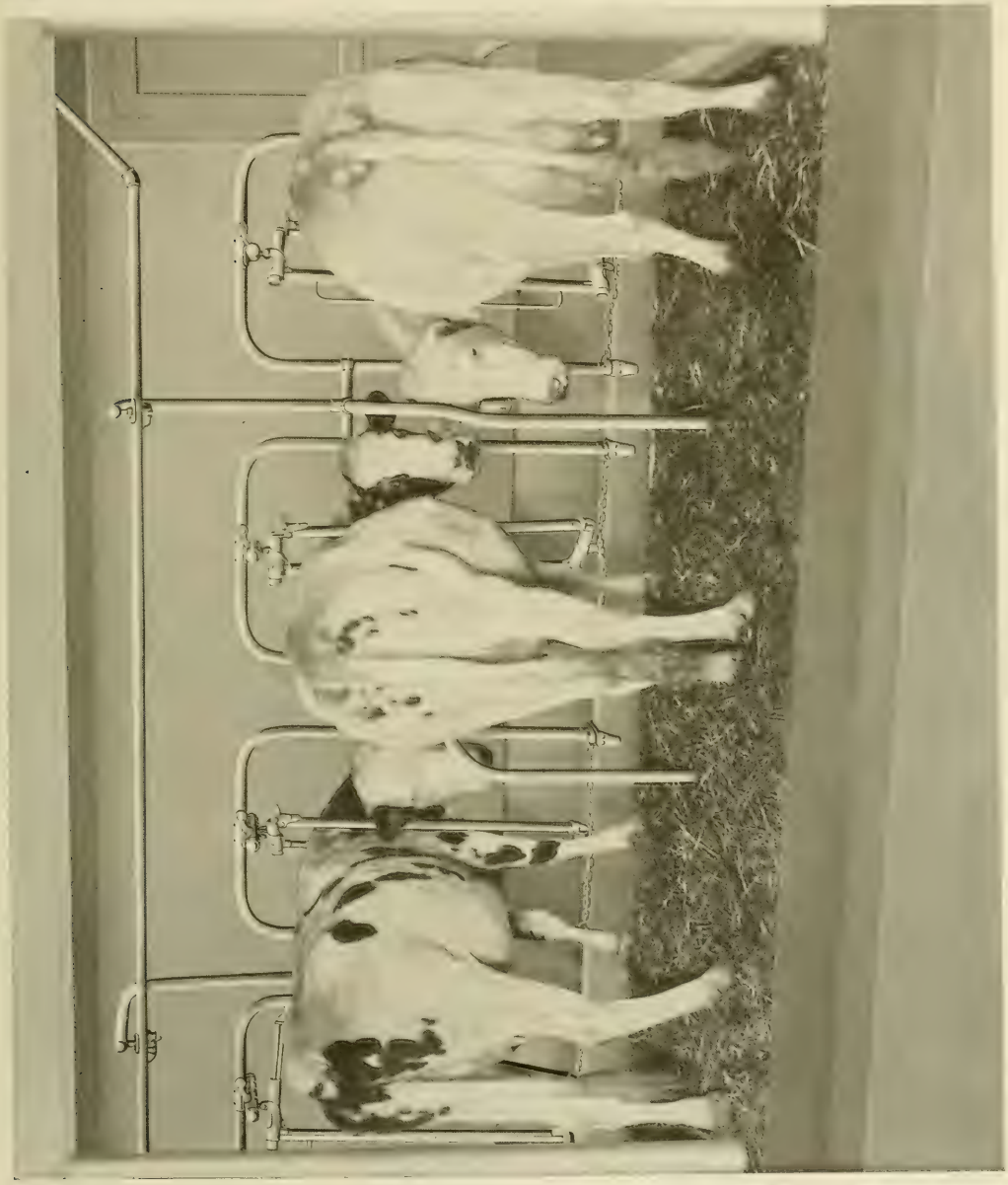
STAR Equipped Barn o



V. Barnes, New Canaan, Conn.



STAR Stalls Keep Cows Clean, Comfortable and Contented



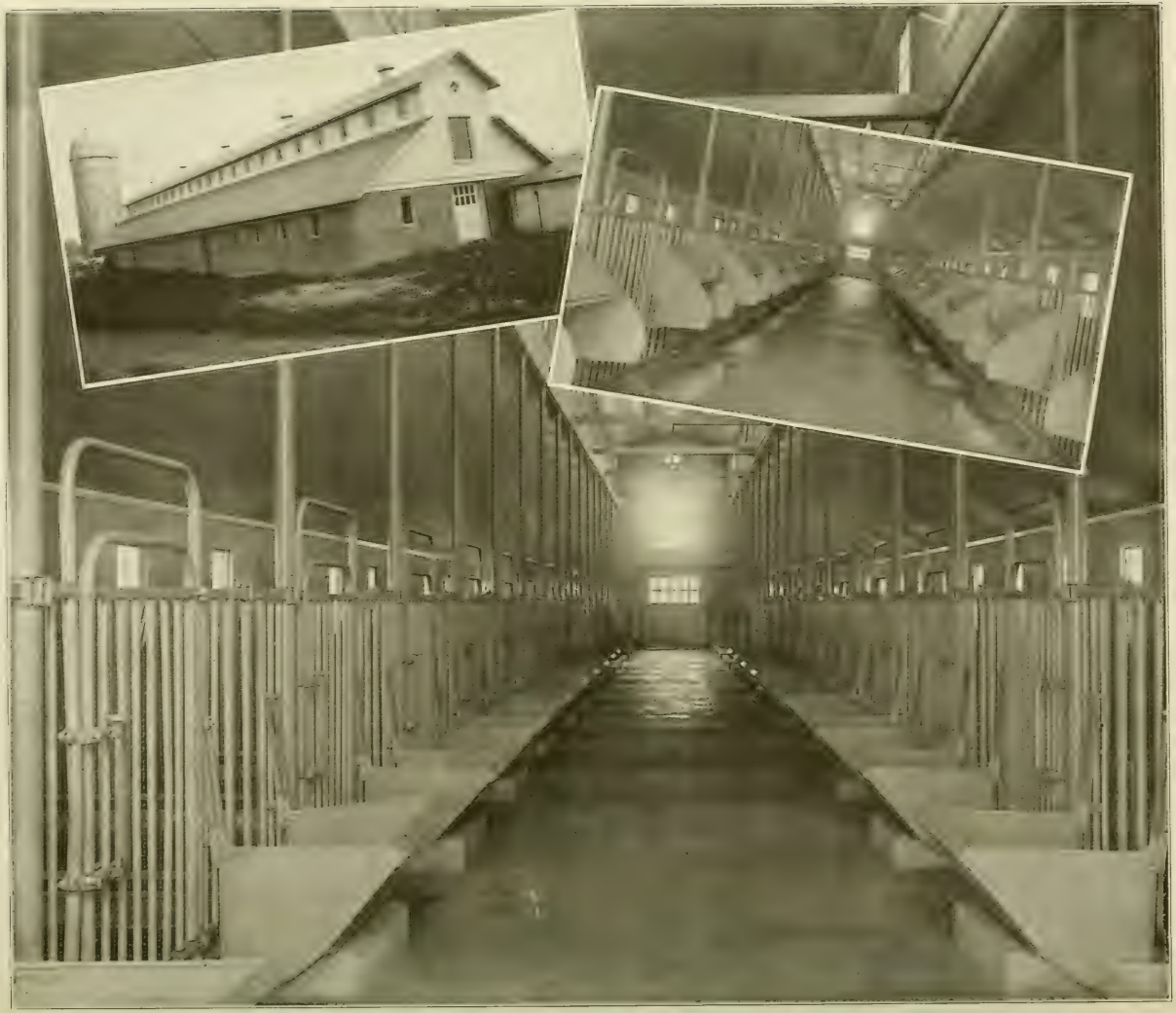
STAR Stalls Afford Plenty of Freedom



No. 20 STAR Steel Stalls in STAR Equipped



Barn on Espanore Farm, at Lansing, Michigan.

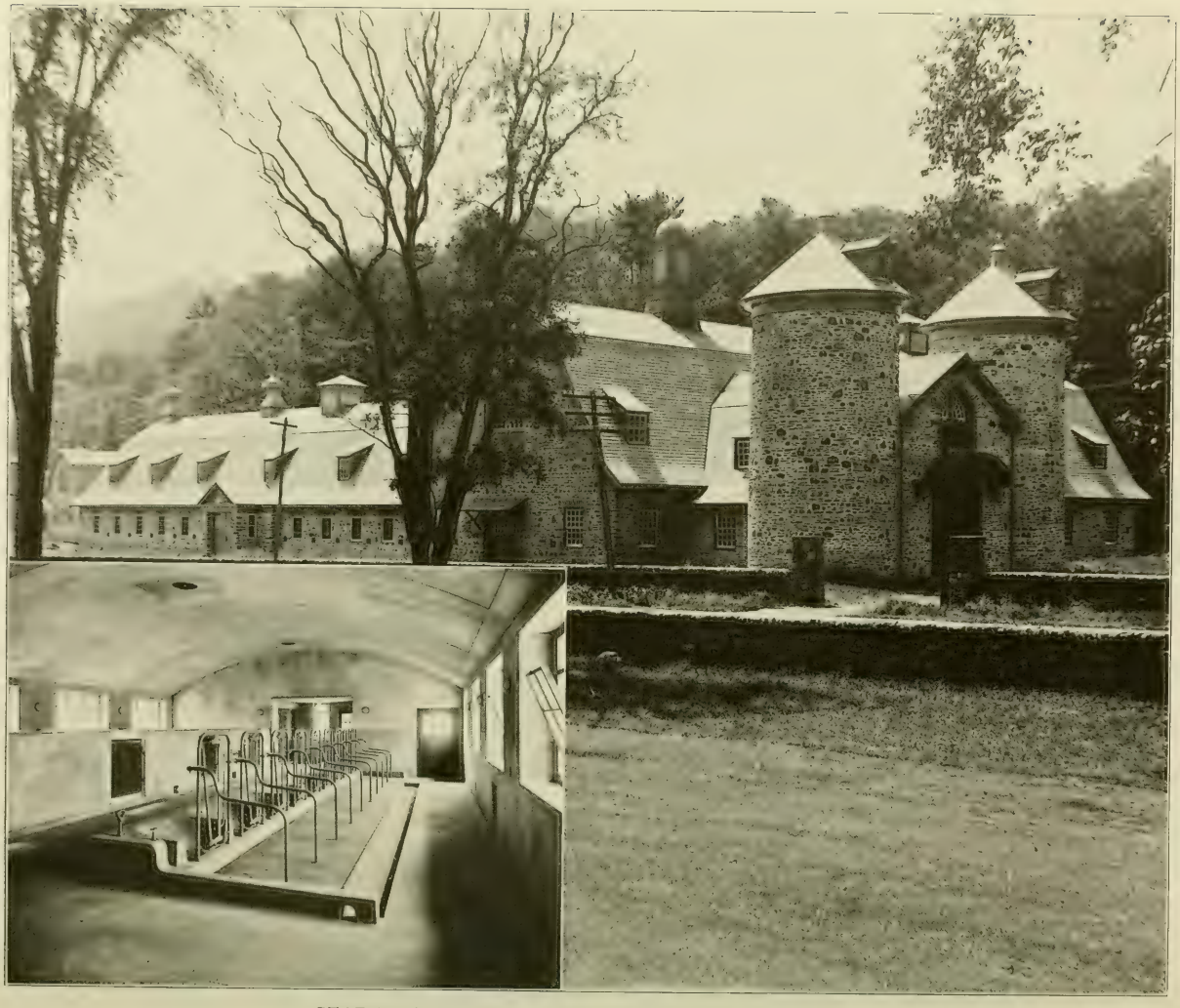


STAR Equipped Barn on Ohio State Institution Farm, near Columbus, Ohio

HUNT · HELM · FERRIS & CO ·



Interior of one of the STAR Experimental Barns



HUNT · HELM · FERRIS & CO ·

STAR Equipment Barn on Clark Estate, Cooperstown, N. Y.



Hyper Hog House No. 4, of the Cutter Laboratories, Berkeley, California. Completely equipped with STAR Steel Hog Pens



J. J. Case's Brookdale Herd

VERY CHOICE

HOLSTEIN FRIESIAN CATTLE

RACINE, WIS., January 5th, 1917.

Hunt, Helm, Ferris & Co.,

Harvard, Ill.

Gentlemen:-

In looking over various barn equipments, I came across a half dozen stalls made by your firm which the owner had installed himself. I was so well impressed with the outfit that I came home and ordered a full equipment for my barn at Brookdale Stock Farm.

After a seasons use, to say that it is entirely satisfactory, and that I am well pleased with it is putting it mildly. Several who have seen this equipment have expressed themselves in favor of the many excellent features therein contained rather than some other make which they had installed.

Wishing you the success the merit of your goods deserve,

I am yours very truly,

J. J. Case





THE CUTTER LABORATORY

ANTITOXINS CURATIVE SERA
TUBERCULINS
BACTERIAL VACCINES
AUTOGENOUS VACCINES, ETC.

INCORPORATED

BIOLOGICS EXCLUSIVELY
PRODUCED UNDER
U. S. GOVERNMENT LICENSE
NUMBER EIGHTY

BERKELEY, CAL., August 12, 1918.

Hunt, Helm, Ferris & Co.,

Harvard, Illinois.

Gentlemen:-

Answering your letter of July 19th we would say that the steel panel work installed in our hog Cholera Plant has been found very satisfactory and has been an important factor in making it the best equipped plant in the world for this work.

Yours very sincerely,

THE CUTTER LABORATORY

TOLEDO
STATE HOSPITAL
GEO. R LOVE
SUPERINTENDENT

Toledo, O. Dec. 7, 1916.

Hunt-Helm-Ferris Company,
Harvard, Ill.

Gentlemen:

Just a word regarding your Star line goods, especially your drinking cups for cattle.

The barn at the Toledo State Hospital is fully equipped with Star goods, and I only have to watch the cows smile when they turn to get a drink of cool water at their will. It makes you feel they are happy and contented while they are working to produce the milk.

We wish to say we like the Star outfit, and gladly recommend the same to all prospective buyers.

Yours very truly,

Geo. R. Love
Superintendent.

Jay E. Pettys
Farm Superintendent.

JLP/CC

Visitors are admitted all days except Sundays and Holidays. Correspondence concerning patients should be addressed to the Superintendent



STAR Equipped Dairy Barn at Toledo State Hospital, Toledo, Ohio

HOLSTEIN FRIESIAN ASSOCIATION OF AMERICA

F. L. Houghton
BRATTLEB

D. D. AITKEN, PRESIDENT, FLINT, MICH.
MALCOLM H. GARDNER, SUPERINTENDENT OF ADVANCED REGISTRY
W. A. MATTESON, CHAIRMAN OF EXECUTIVE COMMITTEE

Wing R. Smith
TREASURER.

Flint, Mich. November 25, 1914.

Hunt, Helm & Ferris,

Harvard, Ill.

Centlemen:--

Your inquiry as to our experience with the Star Equipment in our dairy buildings, permit me to say that everything connected with the equipment is eminently satisfactory. Your representative here- The George W. Hubbard Hardware Company- has had general charge of the installation and the equipment has been installed in accordance with the blue prints and is giving perfect satisfaction.

There is something about this pipe stall equipment that is very pleasing in the care of animals, as it does away entirely with all dead air near the floor that is sure to remain where you use wood partitions or anything that interferes with the circulation near the floor.

I am about to install during the early spring, a calf barn equipment and expect to use the Star Tubular equipment.

Very truly yours,

D. D. Aitken

HOLSTEIN MILK

RAYMOND L. PIKE, MANAGER

HERBERT A. BROWN, SUPERINTENDENT

FAIRVIEW FARM

"PRODUCTION OUR WATCHWORD"

REGISTERED
JERSEY CATTLE
BERKSHIRE SWINE

GENEVA, OHIO.

August 8, 1916.

Hunt-Helm-Ferris & Co.,
Harvard, Ill.

Gentlemen:-

We are enclosing herewith several views of our new sixty cow barn that your architects planned for us, and we wish to take this opportunity to thank you for all your favors and also to tell you that we think the "Star" barn equipment is about the "best ever".

As you know, about two years ago we purchased equipment for thirty cows when we were remodeling our old barn, and liked it well enough that when we were ready to place our order for the sixty cow equipment we considered no other.

In addition to this will say that, as soon as we are financially able, we want to build a twelve box stall barn and it will be equipped with "Star" fixtures.

If our "good word" can ever be of any help to you, do not hesitate to ask for it, for we feel very pleased with our treatment by your firm and want to pass our good luck to our brother breeders.

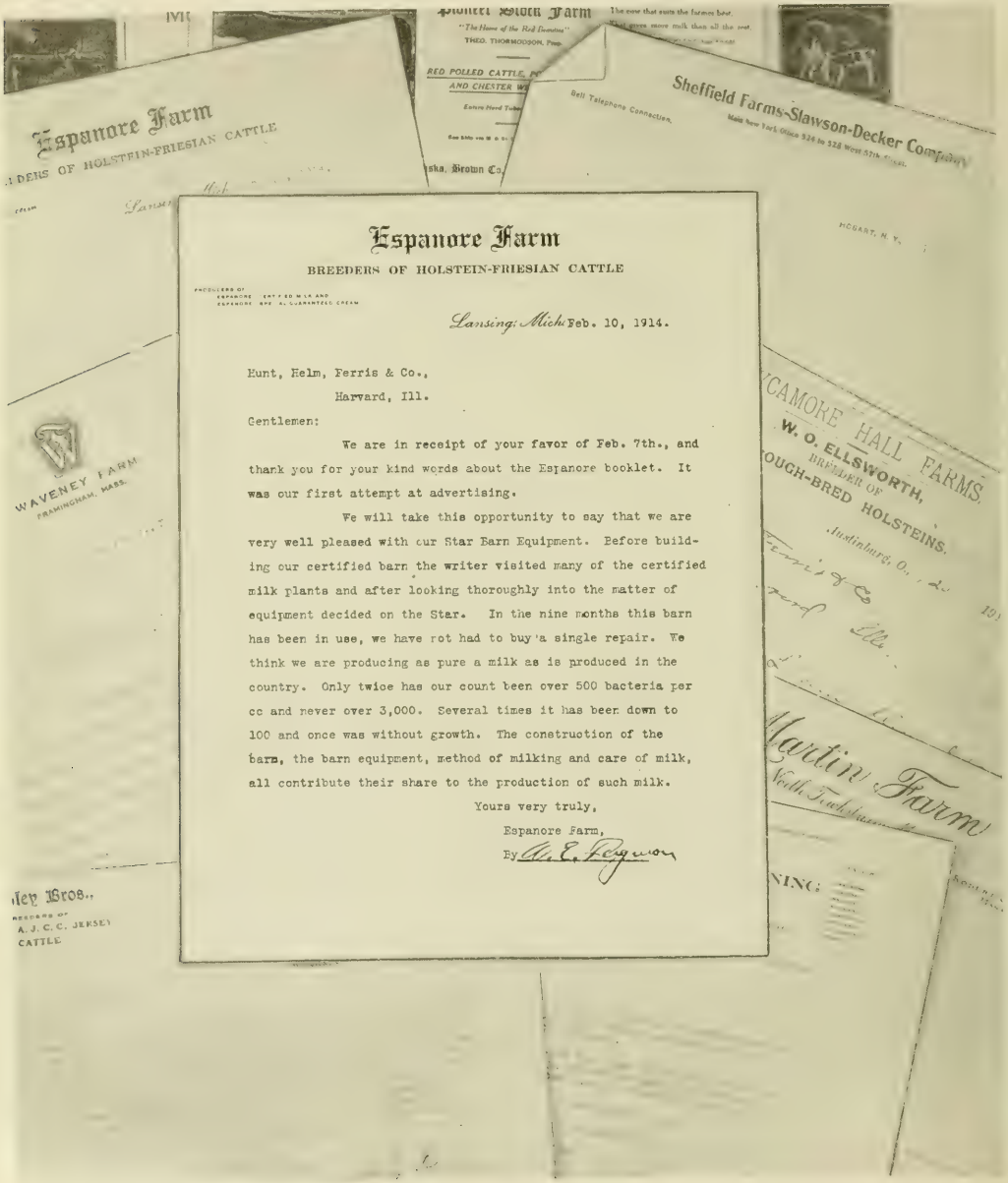
Very truly yours,

FAIRVIEW FARM.

Raymond L. Pike.

Owner and Manager.

RLP:C



Espanore Farm

BREEDERS OF HOLSTEIN-FRIESIAN CATTLE

PRODUCERS OF ESPANORE CERTIFIED MILK AND ESPANORE BRAND GUARANTEED CREAM

Lansing, Mich. Feb. 10, 1914.

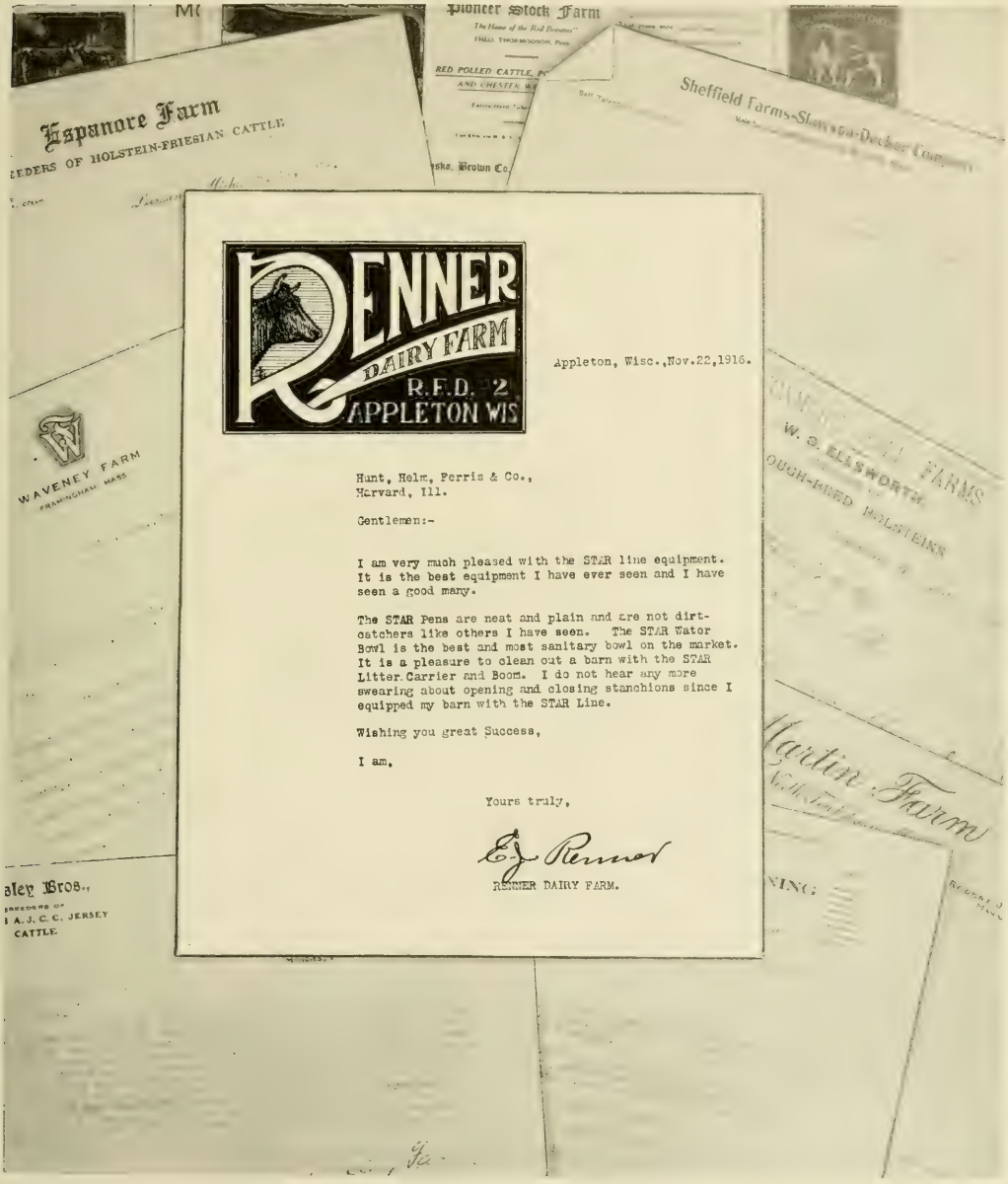
Hunt, Helm, Ferris & Co.,
Harvard, Ill.

Gentlemen:

We are in receipt of your favor of Feb. 7th., and thank you for your kind words about the Espanore booklet. It was our first attempt at advertising.

We will take this opportunity to say that we are very well pleased with our Star Barn Equipment. Before building our certified barn the writer visited many of the certified milk plants and after looking thoroughly into the matter of equipment decided on the Star. In the nine months this barn has been in use, we have not had to buy a single repair. We think we are producing as pure a milk as is produced in the country. Only twice has our count been over 500 bacteria per cc and never over 3,000. Several times it has been down to 100 and once was without growth. The construction of the barn, the barn equipment, method of milking and care of milk, all contribute their share to the production of such milk.

Yours very truly,
Espanore Farm,
By W. E. Ferguson


Espanore Farm
EEDERS OF HOLSTEIN-FRIESIAN CATTLE
Pioneer Stock Farm
RENNER
DAIRY FARM
R.F.D. 2
APPLETON WIS
Appleton, Wisc.,Nov.22,1916.
Hunt, Helm, Ferris & Co.,
Harvard, Ill.
Gentlemen:-
I am very much pleased with the STAR line equipment. It is the best equipment I have ever seen and I have seen a good many.
The STAR Pens are neat and plain and are not dirt-catchers like others I have seen. The STAR Water Bowl is the best and most sanitary bowl on the market. It is a pleasure to clean out a barn with the STAR Litter Carrier and Boom. I do not hear any more swearing about opening and closing stanchions since I equipped my barn with the STAR Line.
Wishing you great Success,
I am,
Yours truly,
E J Renner
RENNER DAIRY FARM.
WAVENEY FARM
FRAMINGHAM MASS
W. O. ELLSWORTH
aley Bros.,
A.J.C.C. JERSEY
CATTLE



BARRINGTON COURT FARMS
BARRINGTON, ILL.

January 14, 1918

Hunt-Helm-Ferris & Company,

Harvard, Illinois.

Gentlemen;

In equipping my farm buildings three years ago I investigated the different equipments offered on the market at that time. After considerable investigation I purchased my entire horse barn and cow barn equipment from you.

I can say that the equipment after three years has proved very satisfactory in every manner and has been the subject of a great many compliments from visitors on the farm. Since the time I installed it I have not been put to one cent expense from breakage or any other cause. I can say without any hesitancy that it has been absolutely satisfactory in every detail as well as the courtesy and attention that I got from your company while installing.

Thanking you for past courtesies, I am

Very truly yours,

William Weller Jr.





STAR

Barns and how to Build Them

Star Barn Plan Service

THE Dairy Barn is the Dairy Farmer's production plant on which he depends for a finished product and income just the same as a manufacturer depends on his factory. And in like proportion as he builds and equips his barn wisely will he obtain satisfactory returns on his investment.

And, as the modern manufacturer, when he builds, has in mind certain fundamentals, such as strength, utility, storage, convenience, light, ventilation, etc., so should the modern Dairy Farmer incorporate into his plans and building certain essentials.

The designing of the barn should no more be left to someone who knows nothing about the purpose and results which it is desired to obtain than a manufacturer would leave the designing of his factory to an architect who was unfamiliar with the requirements.

In this book we aim to show building skill combined with scientific knowledge applied to Dairy Barn construction and equipment. You do not build every year. You build a barn for a lifetime, and there is too much at stake to turn its designing over to someone for experimental purposes.

Our Service Department was established years ago for the purpose of assisting the Dairy Farmer in designing and equipping his barn in a manner that would be economical, convenient, efficient and comfortable. This department is at your disposal. It is composed of men who have specialized for years in barn building and who combine technical knowledge and practical experience in its application.

They have designed some of the largest and best barns in this country from plans that are the result of 35 years' dealing with Dairymen. Conditions vary with different sections of the country. The constructions that are used in the North are not essential in the South.

We are familiar with the conditions and you can safely put your building problems up to us and rest assured of intelligent and satisfactory treatment.



STAR Equipped Barn Owned by Wm. Monear, Richmond, Ill.

Designing and Building the Dairy Barn

The Essentials

IT is our purpose to show the prospective builder the advantages gained by having his Dairy Barn correctly designed, with careful consideration of every detail that makes for convenience, economy and comfort.

The Modern Dairy Barn, correctly planned, affording every possible convenience to the herd and to those who care for the herd, never costs more and often costs less, than a barn that serves merely to house the cattle.

A good barn is a paying investment. It costs less to arrange it conveniently in the first place than to pay for wasted time and labor afterwards on account of poor arrangement. It costs less to build for warmth than to feed for warmth. It costs less to build a sanitary barn, and thereby have a healthy herd, than to pay veterinary bills on account of insanitary conditions.

Since climatic conditions vary, the barn must be adapted to its locality. Also it must conform to the individual needs of the Dairyman. It should be big enough to accommodate a bumper crop and as large a herd as the farm will profitably maintain.

The Practical Barn

There are certain essentials which should be constantly borne in mind in the designing of a Dairy Barn. First of all, it must be practical. Dairying is a very practical industry. There is very little correct theory about it that has not been reduced to practice. The Dairy Farmer is a very practical man. The barn which is to be adapted to his purpose must be a PRACTICAL barn.

The Convenient Barn

Next, the barn must be convenient. It must be arranged to save time and labor. There must be a place for everything and everything must be in the right place, in order that useless steps may be saved and a maximum of result obtained from a minimum of labor. Feeds must be stored and cattle housed and cared for with as little effort as possible. The barn must be CONVENIENT.

The Sanitary Barn

The Modern Dairy Barn must be sanitary. The health of the herd depends on sanitary conditions. Clean and wholesome milk can be produced only in a sanitary barn. To be sanitary, it must be well drained, well lighted, well ventilated and easily kept clean. Milk is our most important food product. Public Welfare demands cleanliness in its production. The Barn must be SANITARY.

The Economical Barn

It is mighty expensive to change a barn once built. Careful planning and the right method of framing can actually make a saving in material alone that will pay for the entire inside equipment. Have your barn correctly designed. Avoid mistakes. By doing so, you will practice economy—economy not only in construction but in operation. The barn must be ECONOMICAL.

The Neat Appearing Barn

Then the barn must be neat in appearance. A properly designed barn shows every dollar put into it. Its attractiveness not only makes it pleasant to the eye, but also makes it desirable to your neighbors or to a prospective buyer,



STAR Equipped Barn, Owned by Theo. Langsley, Fairbault, Minn.

should you wish to sell. The cost will vary according to the size, design, convenience and furnishings, but regardless of the amount expended, the proportions must be correct. It is essential to have a NEAT APPEARING BARN.

The Comfortable Barn

Last but not least, the barn must be comfortable. Let's not overlook cow comfort. No more than you would build a fine home and do without comfortable furnishings, should you build a fine barn and fail to provide comfortable equipment for the herd that is to live in it. There is just one thing that puts the finishing touch on the barn and gives the herd the greatest possible degree of comfort. THAT'S STAR BARN EQUIPMENT.

The Location

In selecting a site for the Dairy Barn, care should be taken to choose a location where the yard will be well drained. It should not be necessary for cows to wallow through mud up to their knees to reach the barn. A cow spends a large part of her time in the barnyard, and careful attention to the sanitary condition of the yard is necessary.

The selection of the site is very important. It is best that the barn should run north and south to get full benefit of the morning and afternoon sun. The barn so arranged will be warmer. Also plenty of sunlight will help to produce proper sanitation. Consideration should also be given to the position of the other necessary buildings. The location of the silos, the hog house, the granary, the pump house, dairy and tool house, with respect to the barn is very important.

All the farm buildings should be located conveniently with respect to each other, and having in mind their appearance as well. The appearance of the barn and adjacent buildings will add to or detract greatly from the value of the farm. A Dairyman is judged largely by his barn.

The Size

Be sure your barn is big enough. It is much more expensive to add to the barn than to make it large enough in the beginning. In determining the size, provide storage room to accommodate a bumper crop. Make it large enough to hold all the cattle your farm can profitably maintain. Experience has shown that the best barns are wide enough to accommodate two rows of cattle running lengthwise. This type affords better ventilation and each row of cattle gets full benefit of the sunlight.

Preference is generally given to a rectangular barn 36 feet wide. This allows for spacious feed alleys, stalls and gutters, and provides for a driveway through the barn, if desired.

Stalls are regularly made in the following sizes: 3 ft.; 3 ft. 3 in., and 3 ft. 6 in. The 3 ft. 6 in. stall gives ample room for any size animal. This is the preferred size as it is important to give each cow plenty of room.

While a one-story barn may be built as an ell or wing to the barn in which the fodder is kept, it is usually more economical to have the Dairy Barn two stories high, providing hay and feed room directly over the cattle. The basement is warmer where there is a loft overhead.

The floor of the loft should be of



STAR Equipped Barn, Owned by John Mason, Elgin, Ill.

double thickness, with heavy paper between. This prevents dust from sifting through. The same purpose can also be accomplished by sealing below the joists.

Another important advantage in a two-story barn is convenience in handling hay and in feeding. Chutes can be constructed above feed-ways, greatly increasing convenience in feeding. The chutes are closed when not in use.

The grinding room and grain bins can also be located on the mow floor and the grain spouted to feed room below. Placed in the mow the bins are readily accessible for filling and feeding and do not utilize the more valuable ground floor space. The two-story barn, in most cases, saves the dairyman the expense of building a separate granary.

The Design

There are various ideas with reference to the design of the barn. A type which will meet requirements in one locality or state may not in any way be adapted to another locality or state due to varying climatic conditions possibly, or else due to variation in the purpose. One farmer may have to consider his pocket book more than another. One farmer may be doing a different kind of dairying than another, or the materials obtainable in one locality may vary essentially from those obtainable in another.

Then, of course, the number of acres tilled and the corresponding amount of fodder raised, also the number of cattle to be housed and the corresponding extensiveness of the project, must all be taken into consideration.

In this book, we have aimed to show a variety in design that will adapt itself to all the varying conditions enumerated above.

What is the most important thing about a barn?

Everything!

No detail should be neglected. But the place where the biggest waste is most likely to appear is in the arrangement of the floor.

To-day a great deal more thought is given to the arrangement of the farm and dairy barn than was formerly considered necessary. The modern barn plan calls for an arrangement which will provide for the many devices intended to reduce labor and improve living conditions of the livestock. Walks, alleys and doors must be laid out in relation to the carrier system and the other farm buildings.

Supposing a little change in the plan would save you fifty steps three times a day. That would figure to over ten miles a year. Ten miles isn't much of a walk, but many barns have a dozen or even more ten mile walks built right into them. Think that over. Then do some careful thinking about the floor arrangement.



STAR Equipped Barn, at Homeopathic State Hospital, Allentown, Pa.

On the barn, Mr. Percy Fensternacher, a recognized authority in State of Pennsylvania, acted as purchasing agent for trustees. After carefully considering all lines, the order was placed with Hunt, Helm, Ferris & Co. for full equipment, including STAR Harvester Hay Tools, and STAR Door Hangers.

The Floor Plan

SOME advocate facing the cows in, others advocate facing them out. Both methods of arrangement have supporters—men of judgment and prominence in the Dairy World.

Usually a prospective builder has made his decision relative to this matter before other details have been considered.

We've endeavored to present the arguments here with pro and con for the two arrangements. This is a subject on which we're neutral. We can see distinct advantages in both—compensations in one that are offset by compensations in the other. This leaves but little choice.

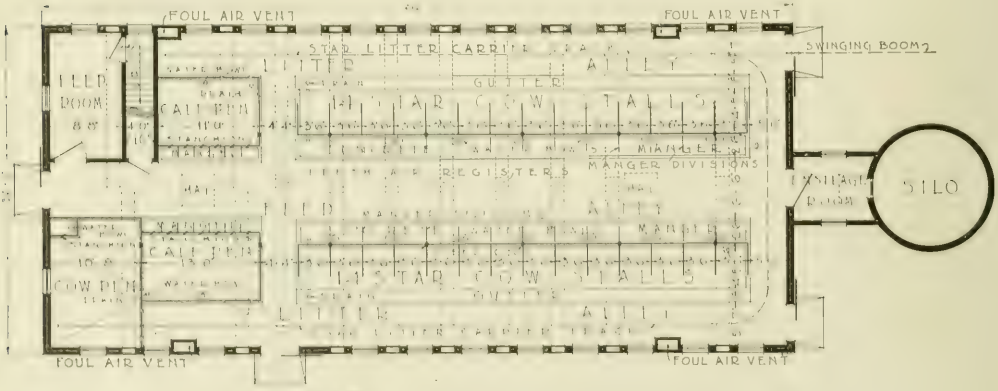
Where Cows Face In

This arrangement of the barn has a number of advantages. You can take the feed all down a center alley and distribute it right and left as you go along. It centralizes the work of feeding. Then the herd is divided so you don't have all the cows trying to crowd through one door at the same time.

The out-take chutes for ventilation are located at the sides of the barn where they are out of the way, and do not occupy space which could well be used for other purposes.

Sunlight strikes the gutters directly and they get the full value of its disinfecting properties. It gives you light behind the cows when milking in the morning and at night.

Another advantage of this arrangement is that some prefer to see all the herd from either end of the feed alley.



·GROUND·FLOOR·PLAN·

Where Cows Face Out

Advocates of facing the cows out, call attention to the fact that while it may be well to do your feeding from one alley, you nevertheless do three-fourths of the work *behind* the cows. Cleaning and milking take more time than feeding.

They claim that the cows breathe better air when they face out than when they face in.

That it's more important to have the disinfecting action of the sunlight applied to the manger where the cow is fed than to the gutter.

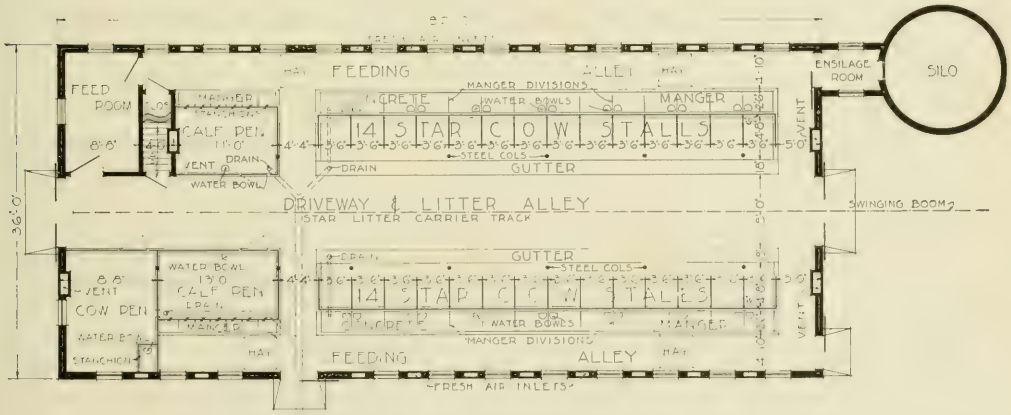
That you've got to build long intake chutes for ventilation if your cows face in.

That you've got to divide your herd to get it into the barn and if you get a cow on the wrong side of the barn, it causes confusion.

Where cows face out the supporting posts for hay loft floor can be placed where they will in no way interfere with the arrangement of the stalls.

Then the appearance of both herd and barn is better where cows face out. Cows are always sized up from behind. Where they face out, the whole herd is seen at one time.

Furthermore, there never was a barn built, where the cows faced the center, that was wide enough to prevent the walls becoming spattered with manure. Facing the cows out prevents this. It keeps all the manure along one alley and the gasses and fumes are more easily disposed of when they are in one place.



GROUND · FLOOR · PLAN ·

Construction Details

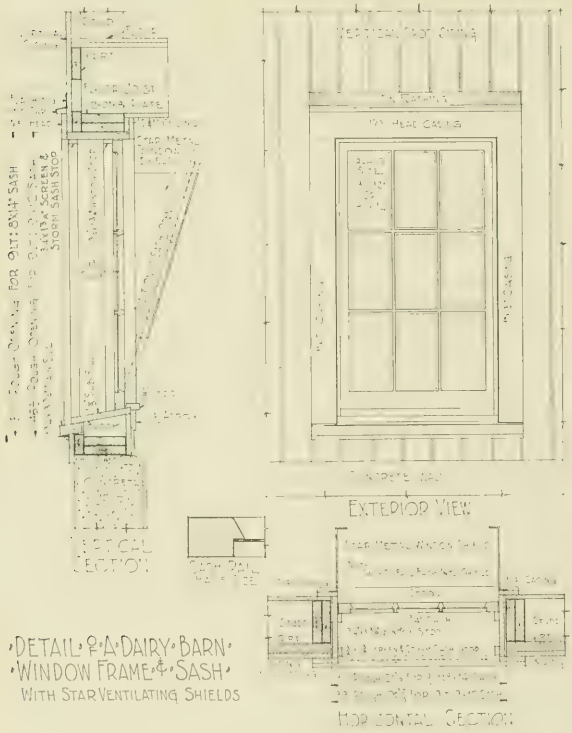
The Foundation

The foundation of a barn should be built with the same care as that of any other building. The bottom of the foundation wall should be at least six inches below the frost line. It should go down to hard pan to minimize settling of the building. The base or footing should be at least two feet wide for a two-story structure. It should be made of concrete, 10 or 12 in. thick.

The Wall

The foundation wall should be carried high enough so that the sills are protected from rotting. We recommend that the wall be run up as high as the bottom of the windows and that it, as well as the ground floor, should be made of concrete.

For a simple, solid wall of concrete, forms are made of matched sheathing with the smooth side in. These are supported by 2 in. x 4 in. studs set 24 in. apart on center. A section of wall 3 or 4 ft. high can be made at one time, but the greatest care should be used to see that the forms are absolutely plumb and thoroughly braced. Bolts about $\frac{7}{8}$ in. x 16 in. should be inserted in the top of the wall at intervals of 6 ft. The threaded ends should stick up about 6 in. above the wall. These are used to anchor the sills.



DETAIL OF A DAIRY BARN WINDOW FRAME & SASH WITH STAR VENTILATING SHIELDS

The Windows

Have plenty of windows and thereby assure an abundance of sunlight. A dark cow barn is unhealthful. Sunshine is life giving. It is Nature's greatest disinfectant.

In determining the number and size of windows to be used in the Dairy Barn, allow at least 4 square feet of glass for each cow. The windows should be evenly distributed and where they are exposed directly to the bleak north wind, storm sash should be used. The inside of the barn should be arranged so as to obstruct the light as little as possible. We recommend the use of single sash windows, as they can be opened inwardly at the top and the air as it enters is diverted to the ceiling, thereby preventing drafts.

The Floor

AS stated before, we recommend the use of concrete for stable floors. Wood floors are no longer used because they soon wear out and quickly become insanitary.

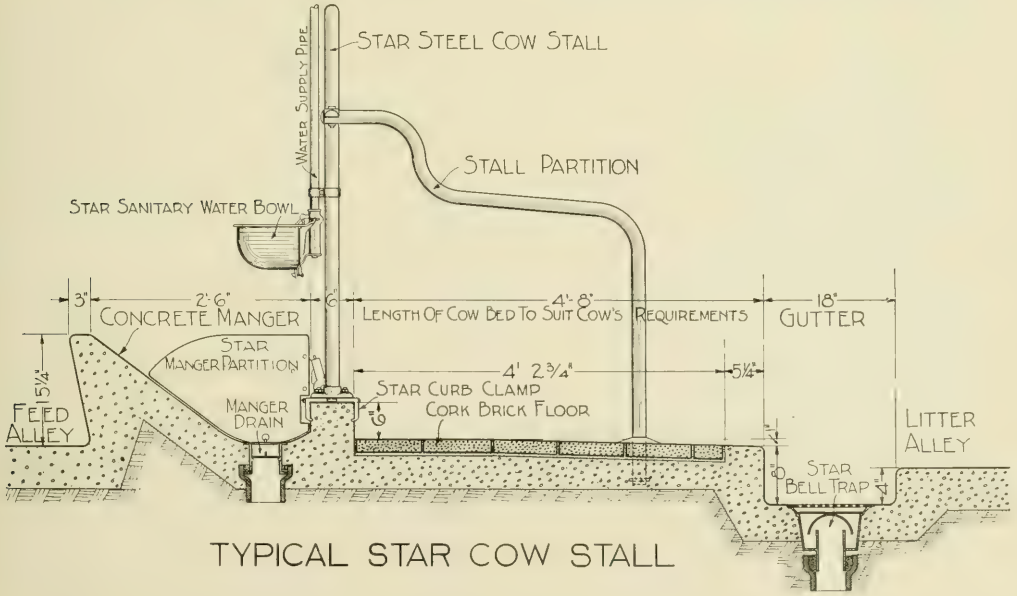
There are two methods of construction. In the old method, a concrete sub-base is first laid, about 5 in. thick, and this is covered with a finish coat about 1 in. thick. The other method is known as a one-course construction. The concrete is made richer in cement and wetter in consistency. To obtain a smooth finish, the coarse material is crowded down by means of a wooden float and the finer material is thus brought to the surface.

The concrete is 6 in. thick and is mixed in the proportion of one part cement, two parts sand and three parts gravel. Enough water is added to make it of a quaky consistency so that when struck with a straight edge a small amount of water will appear on the surface.

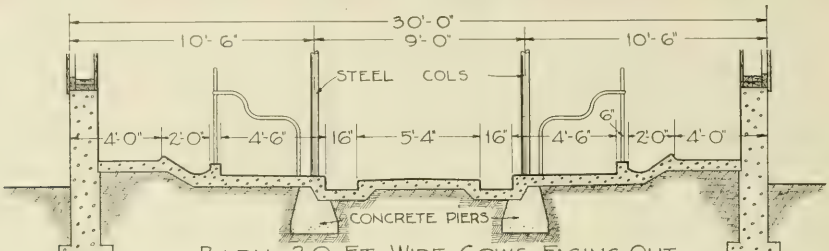
A floor laid according to this method will not wear slippery.

To get the best results, freshly laid concrete should be protected from extremes of temperature. A wet straw covering during the hot weather prevents a too rapid hardening, but it should not be put on until the surface of the work has set somewhat.

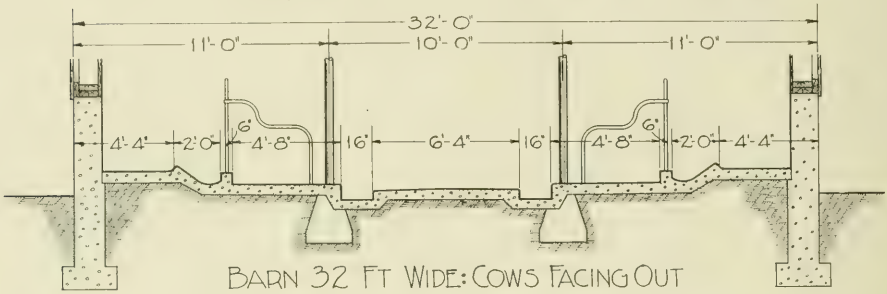
In freezing weather, fresh concrete should be covered with straw just after



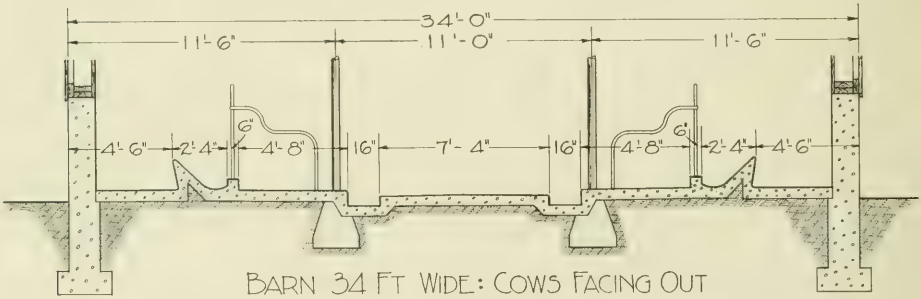
TYPICAL STAR COW STALL



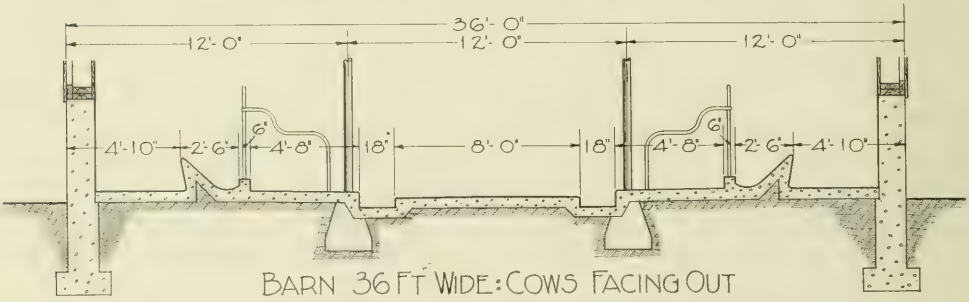
BARN 30 FT WIDE: COWS FACING OUT



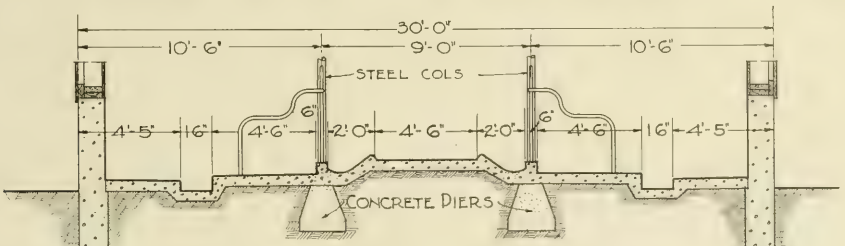
BARN 32 FT WIDE: COWS FACING OUT



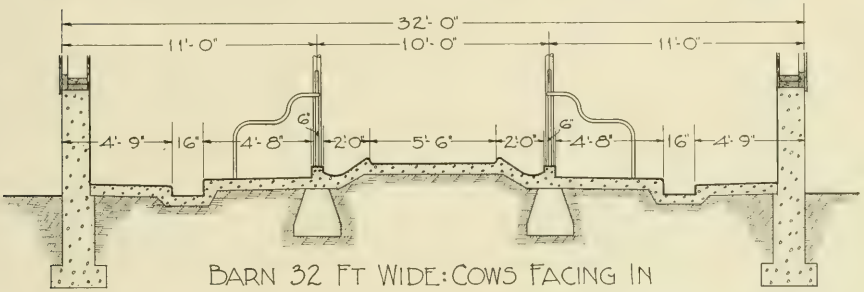
BARN 34 FT WIDE: COWS FACING OUT



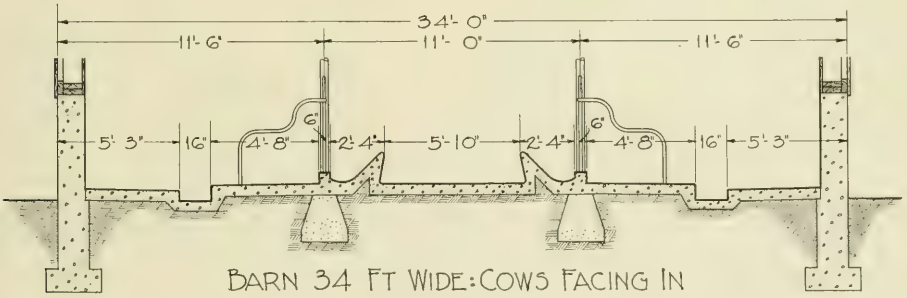
BARN 36 FT WIDE: COWS FACING OUT



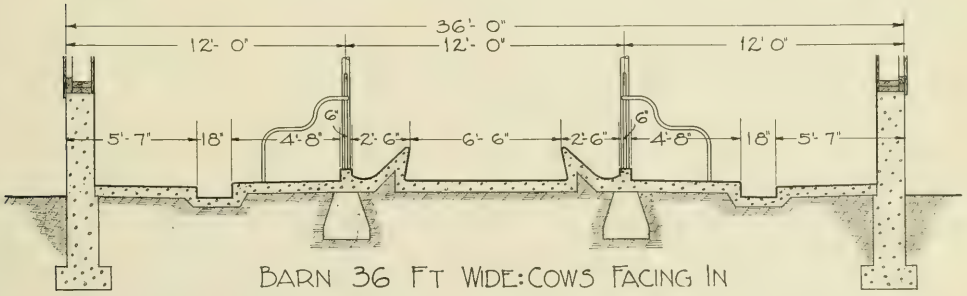
BARN 30 FT WIDE: COWS FACING IN



BARN 32 FT WIDE: COWS FACING IN



BARN 34 FT WIDE: COWS FACING IN



BARN 36 FT WIDE: COWS FACING IN

it begins to set and this covering should be left on for at least thirty-six hours.

Some objection has been raised to concrete floors on account of their being too cold in severe weather for cows to stand or lie upon. This objection may be overcome by covering the stall floor with Cork Brick, set in the concrete, which provides a surface as impervious to water and as easy to keep clean as the concrete itself.

Floor Level

It is important to get the right floor level. The dirt should be levelled off, cutting it down where too high, and filling in where too low, wetting and tamping until a hard surface is obtained. It should be noted that the cleaning, or litter alley floor, both where the cows face in and out, is on a level with the top of the door sill, or 6 in. above grade. The established ground floor level will, therefore, be 6 in. below the door sill if the floor is 6 in. in thickness.

Drainage Grades

The litter and cleaning alleys should have a slight pitch toward the gutter.

Where a high feed alley floor is used the floor should pitch toward the manger.

There should also be a certain amount of slope in the length of manger and gutter.

These pitches in most cases being slight, the variation in grade can be made in the level of the dirt floor or by varying the thickness of the concrete floor.

After the levels have been established, the drain tile can be laid and the drains and traps set at correct heights.

The main floor level having thus been determined, the levels of the gutter floor, stall bed, manger and feeding floor can be easily obtained, being indicated by the use of sticks or by marking the walls.

By referring to pages 140 and 141, showing sectional diagrams of dairy floors, the various arrangements, measurements, and levels may be noted.

Curb

The curb is the first part of the floor to be built. Make it 6 in. high above the cow platform, and 6 in. wide.

If STAR Curb Clamps are not used, the stalls should be assembled, set up, and plumbed true and straight in the curb form before the curb is poured.

Cow Bed

After the manger, the cow bed or platform is put in.

This should be about 4 ft. 6 in. long for Jerseys, Guernseys and Ayershires. A platform 4 ft. 8 in. to 4 ft. 10 in. is recommended for Holsteins and Durhams.

Twenty inches back from the curb, an elevation of ¾ in. should be put in to hold the bedding in place and provide a foothold for the cow when rising. From this point, the cow bed should slope toward the gutter gradually ¼

in. to the foot. This provides for drainage and permits the cow to stand with front and hind feet on the same level.

The surface of the cow bed should be brushed with a broom before drying, in order to give the animals a safe footing.

The level of the cow bed should be 3 in. above the level of the litter alley.

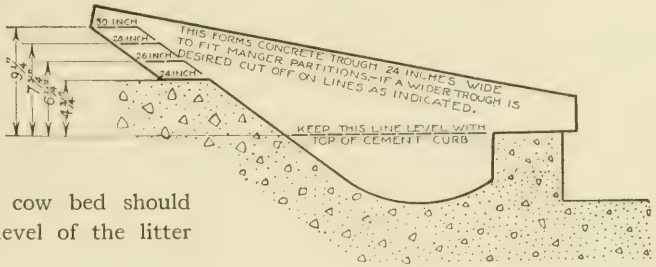
Manger

The manger is constructed next.

There are two types of mangers, as shown by the illustrations on this page. Each type has its advantages.

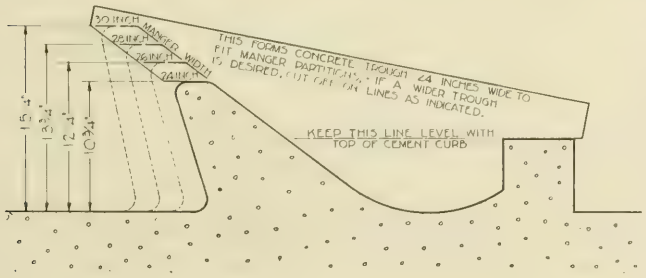
The manger at the right is brought up to the level of the feed alley—where there is plenty of room between the feed alley and the ceiling. A manger of this type is often desirable for the reason that it is convenient to push the fodder back into the manger.

The manger shown at the left of the page is brought up higher than the feed alley. The advantage of this construction is principally that the alleyways throughout the barn are all on a level. There are no inclines to overcome.



We consider that both constructions are practical and these constructions represent the two most popular types of mangers now being built.

Wooden forms, or templets, are furnished for forming either manger illustrated. The manger should be 28 in. to 30 in. wide and should have a proper slope to drain. This width is needed so that the feed will not be scattered and wasted. When the cow eats, she takes a mouthful and extends her nose straight out in front. The distance from the stanchion to the end of the nose is from two to two and one-half feet. Therefore, a manger wide enough to catch the scattered feed is necessary.



The sloping concrete manger keeps the feed within reach at all times.

This is an important point, for when cows reach too far they are liable to slip, thus causing big knees, various sprains and bruises.

The surface of the manger should be finished with a steel trowel and made as smooth as possible.

Gutter

The gutter should be 8 in. to 10 in. deep on the side of the cow bed, and 16 in. to 20 in. wide. Constructed in this manner, the gutter is wide and deep enough to accommodate the manure and keep the cows clean. On the side of the alleyway, the gutter should be about 3 in. to 5 in. deep so the cow can easily back out of the stall.

The bottom of the gutter should have a pitch of ½ in. from the stall side to the alley side so that the liquids will run to the back of the gutter. It should be trowel-finished in order that it may be easily cleaned. It should be sloped to a drain so that it can be flushed when necessary.

Feed Alley and Cleaning Alley

The balance of the floor is devoted to the feeding alleys and the cleaning alleys. The width of the feeding alley and the level above the ground floor will be determined by the type of manger used.

The proper height of the feed alley floor, where the floor is brought to the level of the top of the manger, is shown by the illustration at the top of page 143.

The bottom of the manger and cow bed are on a level. The feed alley is, therefore, equally high above both. The amount of room left is devoted to the cleaning alley, which should be brushed with a broom before the concrete has set in order to give it a rough finish.

The importance of making the barn wide enough will be seen at once because anything taken from the width comes out of the alleys and a narrow alley is an inconvenient place in which to work.

The Drains

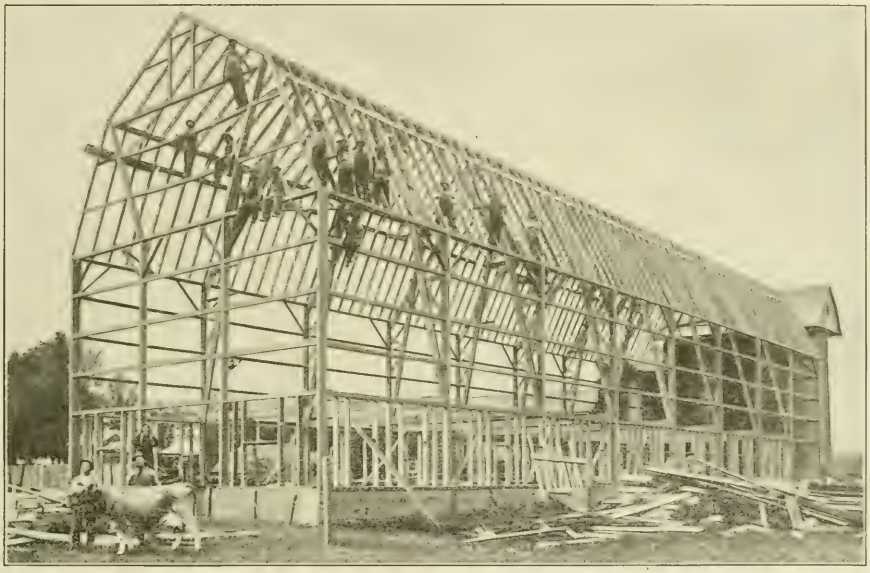
Every part of the concrete floor, as well as mangers and gutters, should be provided with a means of drainage so that they can be flushed with water and thoroughly drained.

Care should be taken, however, that the walks and alleys are nearly level so that there will be no danger of the cow slipping.

Posts or Columns

In planning the inside arrangement of the barn, one of the most important matters to consider is the arrangement of the posts or columns. These should be located in the curb between the stalls and in line with them where the cows face in, and they should be placed back of the stall partitions where the cows face out.

Steel columns are preferable to wood posts because they occupy less space, are stronger and are more durable—also, because they offer less obstruction to the light and are not subject to decay. They are more sanitary.



The Star Trussed Roof Barn

THE plank frame construction has taken the place of the old style timber frame construction for the following reasons:

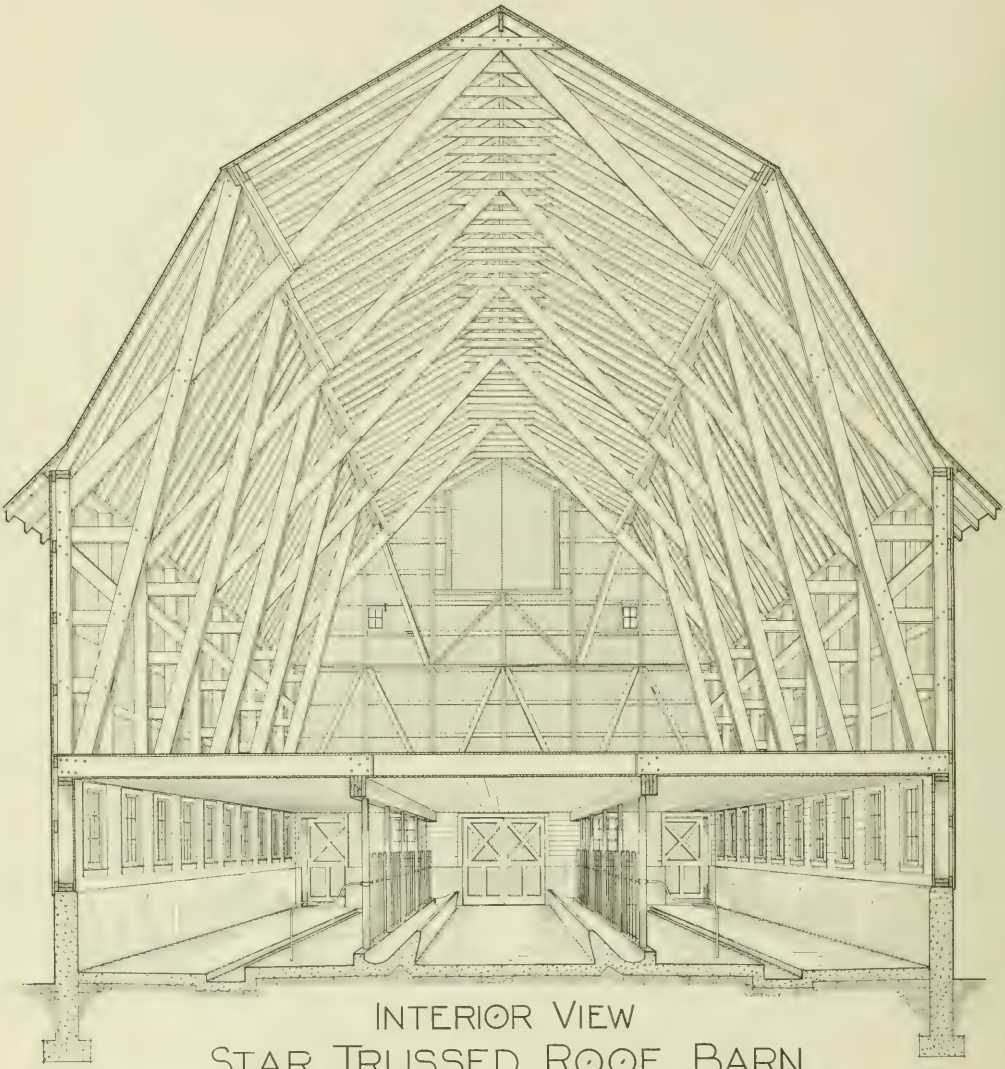
1. It is stronger.
2. It is cheaper.
3. It is easier to build.
4. It provides more loft room.

The timber frame construction depends for its strength on careful work in making the joints and on the heft of material used. A timber frame is no stronger than its weakest tenon. The plank frame is heavily braced. It is made up of several trusses. These trusses are placed at intervals lengthwise of the barn ranging from 10 to 14 ft. apart, depending on the height of the building. The plank frame is so trussed and knit together that the strength of every fiber is brought into use. Heavy timbers are scarce and consequently expensive. In the plank frame construction, nothing heavier than 2 in. planks are used.

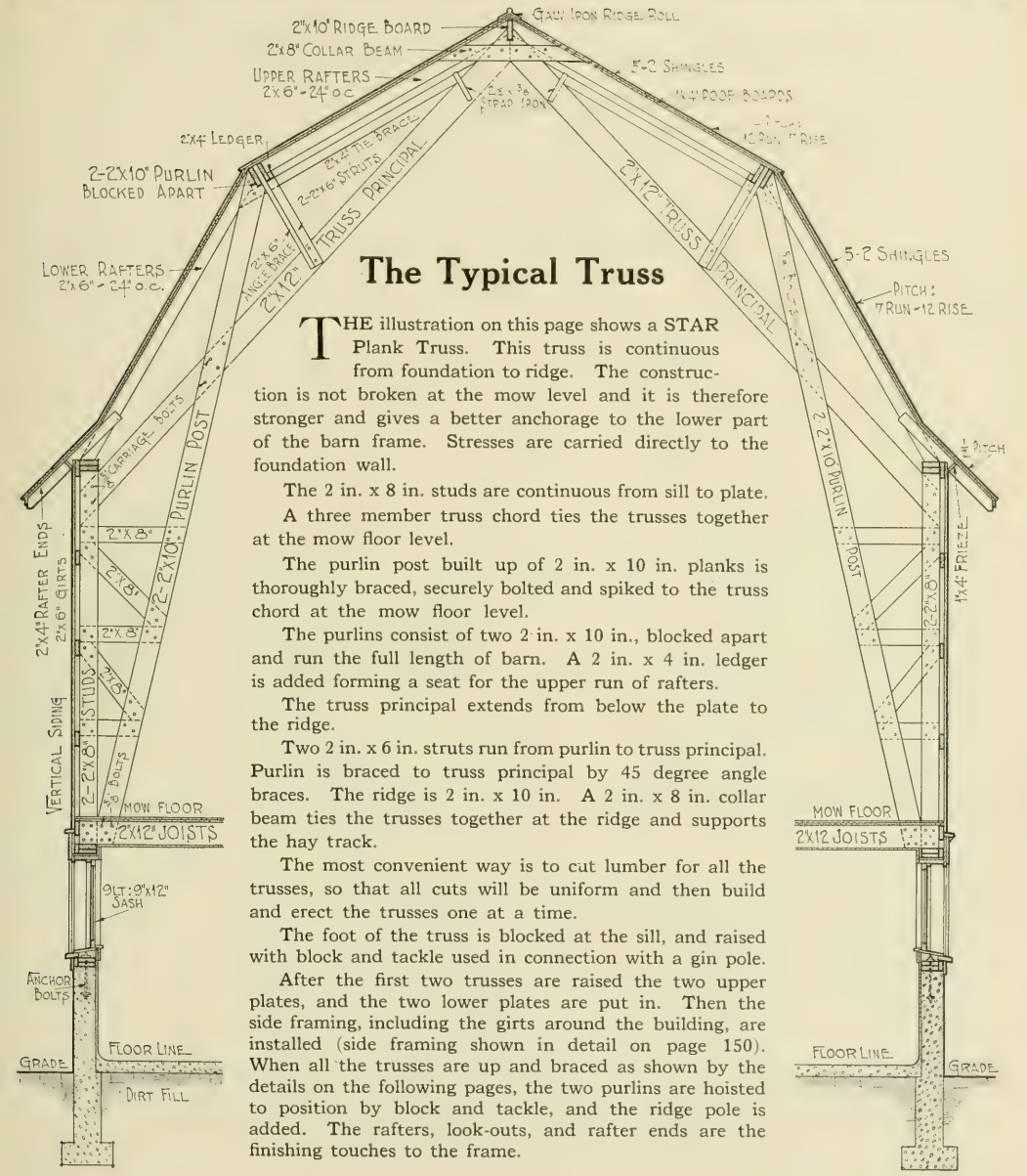
In erecting a plank frame barn, no scaffolding is required. When the first truss is completed, it serves as a pattern for the others which are made exactly like it. It is an easy matter to erect the trusses, this being accomplished either with a small gang of men or a horse and tackle.

The plank frame construction makes easy the putting away of the hay in the mow with the hay carrier as there are no crossed beams or heavy supporting timbers in the way. Therefore, requires less help to put away the hay and it can be done in much less time—which is an important factor in hay making.

This construction also provides for much more storage space in the loft.



INTERIOR VIEW
STAR TRUSSED ROOF BARN
PLANK FRAME CONSTRUCTION



The Typical Truss

THE illustration on this page shows a STAR Plank Truss. This truss is continuous from foundation to ridge. The construction is not broken at the mow level and it is therefore stronger and gives a better anchorage to the lower part of the barn frame. Stresses are carried directly to the foundation wall.

The 2 in. x 8 in. studs are continuous from sill to plate.

A three member truss chord ties the trusses together at the mow floor level.

The purlin post built up of 2 in. x 10 in. planks is thoroughly braced, securely bolted and spiked to the truss chord at the mow floor level.

The purlins consist of two 2 in. x 10 in., blocked apart and run the full length of barn. A 2 in. x 4 in. ledger is added forming a seat for the upper run of rafters.

The truss principal extends from below the plate to the ridge.

Two 2 in. x 6 in. struts run from purlin to truss principal. Purlin is braced to truss principal by 45 degree angle braces. The ridge is 2 in. x 10 in. A 2 in. x 8 in. collar beam ties the trusses together at the ridge and supports the hay track.

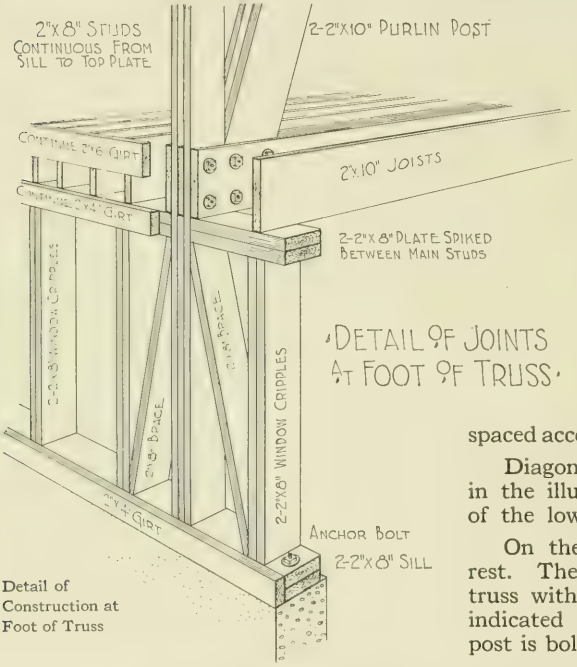
The most convenient way is to cut lumber for all the trusses, so that all cuts will be uniform and then build and erect the trusses one at a time.

The foot of the truss is blocked at the sill, and raised with block and tackle used in connection with a gin pole.

After the first two trusses are raised the two upper plates, and the two lower plates are put in. Then the side framing, including the girts around the building, are installed (side framing shown in detail on page 150). When all the trusses are up and braced as shown by the details on the following pages, the two purlins are hoisted to position by block and tackle, and the ridge pole is added. The rafters, look-outs, and rafter ends are the finishing touches to the frame.

Detail of Construction at Foot of Truss

THE illustration on this page shows in detail the construction at the foot of the truss, including the sill and the lower plate.



Detail of Construction at Foot of Truss

This drawing shows particularly well the continuous studs running from sill to plate, instead of starting at the second floor. The strength of this construction is easily seen.

The sill, built up of two 2 in. x 8 in., with joints broken and lapped at the corners, is anchored to the foundation wall by bolts embedded in the concrete for that purpose.

Upon this sill the trusses, as described on the preceding page, are raised. The lower plate is made of two 2 in. x 8 in., and is spiked and placed between the continuous studs. It is supported by 2 in. x 8 in. cripple studs, which are spaced according to the windows to be used.

Diagonal braces are placed as shown in the illustration to support the ends of the lower plate.

On the lower plate the floor joists rest. The truss chord connecting one truss with the opposite truss is clearly indicated in the drawing. The purlin post is bolted to the truss chord.

Details of Construction at Top Plate

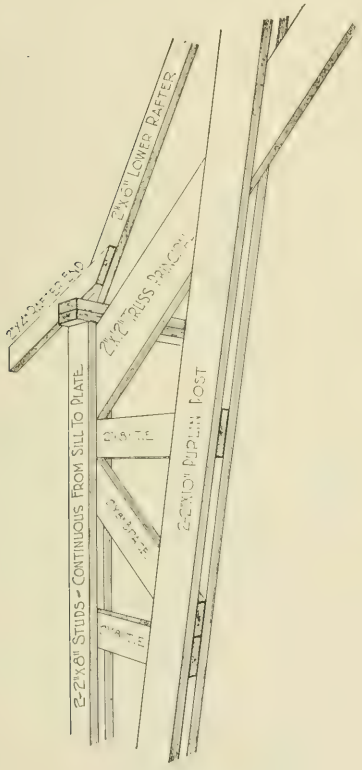
AS illustrated on opposite page, a built-up plate constructed of two 2 in. x 8 in. rests upon the 2 in. x 8 in. continuous studs. This plate runs around the entire building. All corners are well lapped and joints broken. The lower end of the 2 in. x 12 in. which forms the truss principal is bolted and spiked between the two 2 in. x 8 in. studs, directly beneath the plate.

The truss principal is also bolted and spiked where it crosses between the two 2 in. x 10 in. which make up the purlin post. Horizontal braces and single pieces of 2 in. x 8 in. are spiked in place as shown in the illustration. The drawings showing the side framing and end framing on following pages clearly show any other details of wall construction.

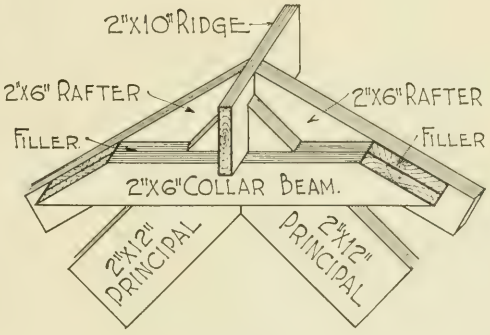
Detail of Construction at Purlin

IN the illustration below is shown a detail of the construction at the purlin. The purlin is made of two 2 in. x 10 in. held apart by blocks, or spacers, at intervals of about 3 ft. The purlin is supported by the purlin post which is cut to receive it, as shown in the illustration. A two member strut connects the purlin and purlin post with the truss principal. One end of a 2 in. x 6 in. diagonal brace is spiked to the purlin, 4 ft. from the bent. The other end is securely spiked to the truss principal. On the other side of the truss another angle brace is spiked in like manner, as shown in the illustration.

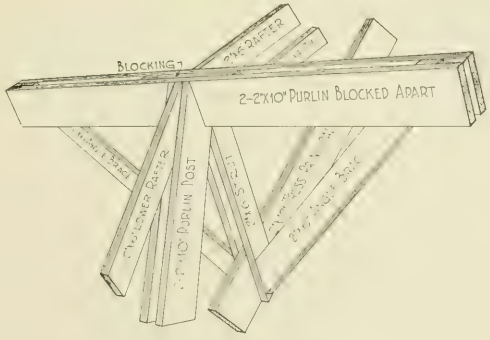
Note particularly how the various members are joined and knit together. There can be no sagging roof with this kind of construction.



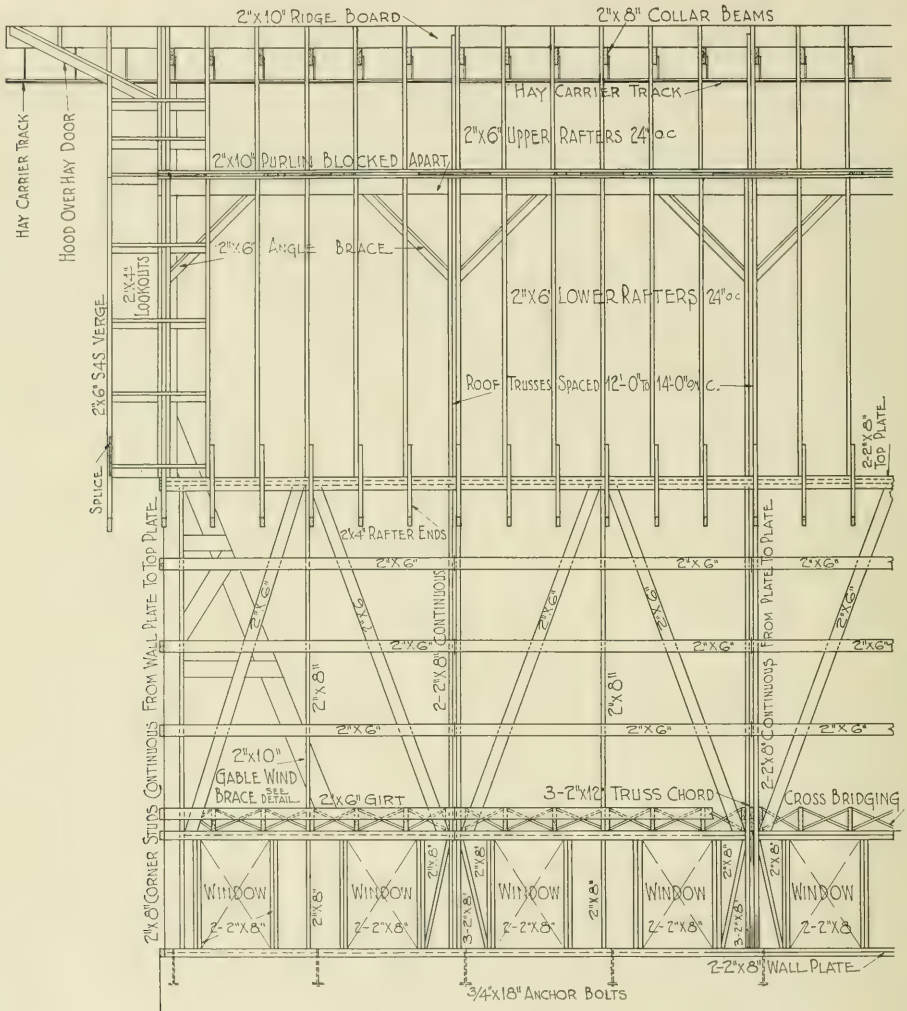
Detail of Truss at Top Plate



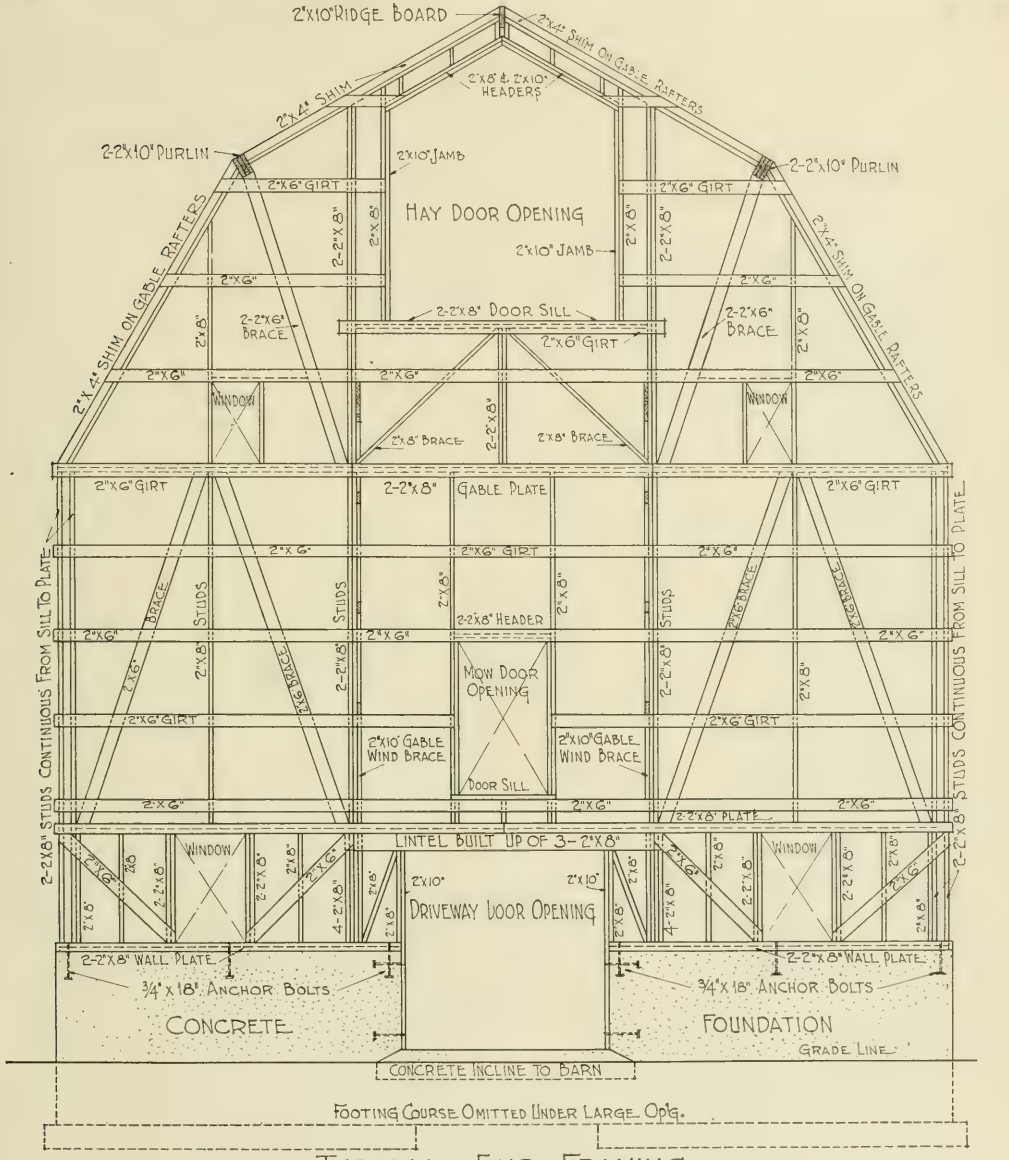
Detail at Ridge



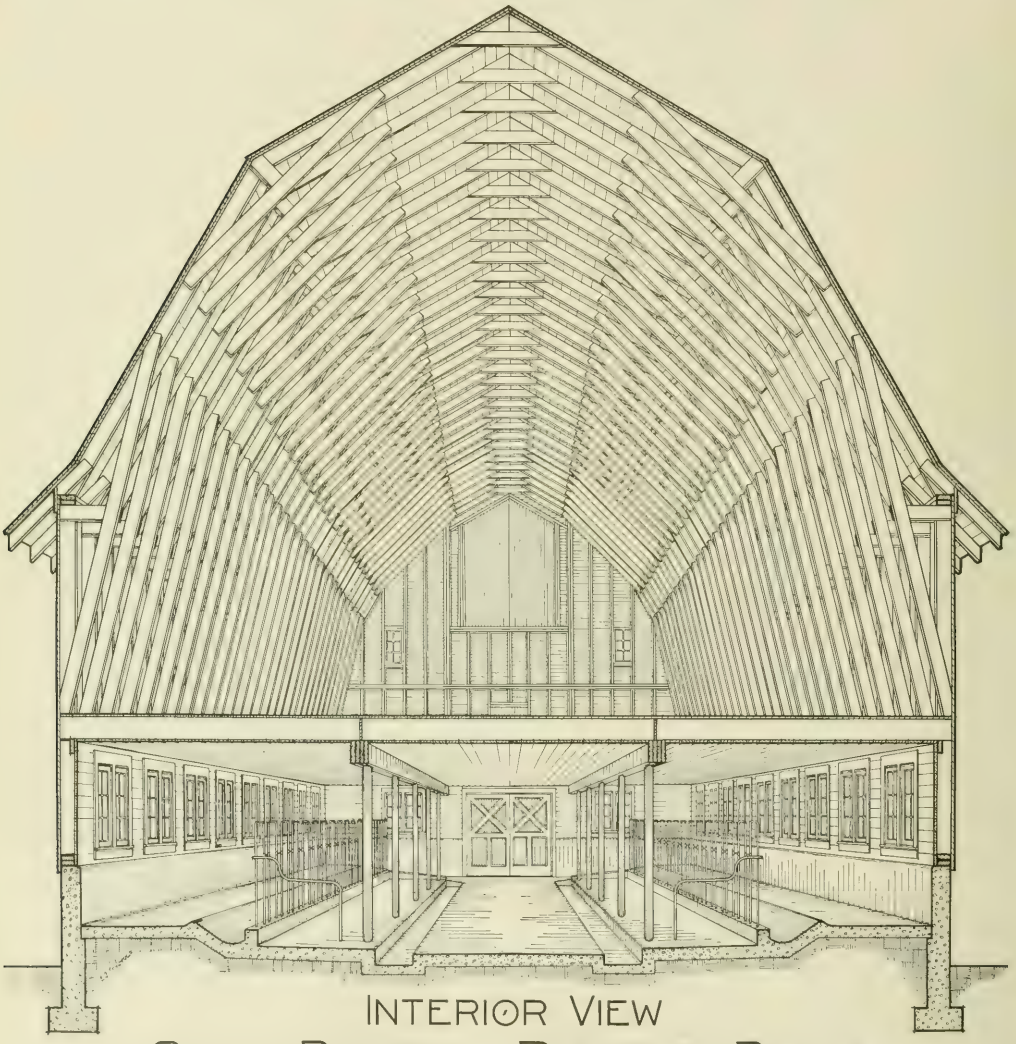
Detail of Truss at Purlin



PART · SIDE · FRAMING



TYPICAL END FRAMING



INTERIOR VIEW

STAR BRACED RAFTER BARN

PLANK FRAME CONSTRUCTION

Star Braced Rafter Barn

WE submit on the opposite page another type of barn construction—the STAR Plank Frame Braced Rafter Barn—a popular type of construction for the short, low structure, not exceeding 36 ft. in width.

An advantage of this type of construction is that short lengths of lumber are alone needed. The lumber can be secured from the smallest dealer's stock, as no timber going into this frame is over 12 in. wide, and 16 ft. in length. A mechanic is not required to frame this barn, as there are few difficult joints to make—a feature that will be appreciated by the farmer who is his own carpenter.

This barn has been widely advertised as requiring less lumber than a truss roof barn. Built of equal capacity and substantially framed, it has, however, been definitely proven by estimates furnished by two lumber concerns that it contains more board feet of lumber than a truss barn.

In the use of this construction, no posts are required in the hay mow to support the peak of the roof as the roof is self-supporting. For this reason, the largest amount of storage space is provided in the mow and there are no obstructions to hinder in the unloading of hay by means of Hay Carriers and Tracks.

The Star Gothic Roof Barn

There is still another type of construction, known as the Gothic type, which is used to considerable extent and which has several points of advantage. We do not show any details of this style of construction, but do show on pages 169 and 182, exteriors made after this type.

This barn is particularly admired for its attractive appearance. It is easy to build and comparatively inexpensive. The Gothic rafter is made from 1 in. lumber, built up to the required thickness by nailing together several pieces of 1 in x 4 in or 1 in x 6 in. material. The curve is marked out on the loft floor, along which blocks are nailed and to these blocks, the first member of the rafter is bent and nailed and the rafter built to the size required by adding 1 in. material, which is bent to the curve and nailed. All the rafters are made in one form.

This type provides an unobstructed hay mow and a roof that is well drained and strong, as is implied by its arched construction.

Ventilation

BARN ventilation is a necessity. It is just as essential that stock should be supplied with an adequate amount of fresh air every 24 hours as it is that they should be supplied with food and water —it is even more necessary, as pure air is not only essential but vital.

We are too apt to reverse the order because of being under the necessity of providing the food and water at whatever expense, whereas pure air is an ingredient that automatically comes into the building and we get the impression that all we have to do is to open a door or a window or a sufficient number of them and it will be supplied without any especial effort on our part.

The very reason that this erroneous idea prevails explains why, in the majority of cases, so little thought is given by the man who builds a barn to the important subject of ventilation.

In some cases, farmers do give thought to the subject and try to work out a system of ventilation of their own with the usual result that it proves unsatisfactory. Now, almost any system of ventilation is better than no system, but there is no reason why the best should not be had when it can be obtained at as little cost as something far inferior.

The matter of barn ventilation is not complicated or difficult to understand. There are only three factors that enter into it -the areators or cupolas, the fresh air intakes or flues and the foul air out-takes or flues.

When these three are installed in the right relationship to each other and of the proper size, then the correct system of ventilation is bound to result, which means that a constant supply of pure, fresh air will be taken into the barn and the foul air, laden with impurities and moisture, will be removed from the barn and not only will the stock be supplied with an abundance of pure air, but the barn itself and its contents, other than stock, will be kept in a dry, clean and healthful condition.

The dairyman is most interested in getting the largest amount of milk yield possible. It goes without saying that in order to do this,

Ventilation—Continued

he must have a healthy herd. It is equally apparent that in order to have a healthy herd, an abundance of pure air must be supplied as well as an abundance of pure food. They are set down here in the order of their importance, since as stated, pure air is more vital than pure food and, in quantity, requires to be furnished in doubly the amount.

Suppose you own a herd of 40 Holstein cows. You would not think of giving these cows from one-quarter to one-half as much feed and water as would be required to keep them either healthy or productive. The thought would be absurd. But if you fail to provide a system of ventilation which will give these same animals the proper amount of pure air, then you have failed to the same degree as though you had deprived them of adequate feed and water. True, without the proper pure air supply, they might not die, at least for a long time, but these same cattle would continue to live for a considerable length of time only half fed and half watered.

Cattle may be starved by depriving them of a proper supply of pure air just as they would be starved by a lack of food or water. The only difference is that it is readily detected if the herd is starving because of a lack of food, where it is not so easily determined that they are starved by a lack of pure air.

You have doubtless noticed a rough, scrawny herd turned out to pasture in the spring, thin, lifeless and with the appearance of having been poorly kept. The natural thought would be that this condition was due to insufficient food and water but a careful analysis will more frequently prove a lack of sanitation, insufficient sunlight and little or no ventilation.

Note the improved appearance of the same herd 30 days later. Too often this change is attributed to the green pasture afforded the herd and not often enough to the fact that out-of-doors the herd has the opportunity to obtain in quantities the pure air of which it had been deprived during the winter in a poorly ventilated barn.

Why Pure Air Is Required

IF a constant change of air is needful, then the flow should be sufficient and continuous at all times. This cannot take place unless the proper system is provided.

To illustrate more forcibly how imperative is the need of pure air, let us state that the lining membrane of the lungs of an ordinary cow, if it could be stretched out in a continuous sheet, would have an area of 1,500 square feet. This area is equal to that of the sides and ceiling of a room 11 ft. square and the same height.

In order that the blood may have an opportunity of absorbing the oxygen brought into the lungs, this membrane contains a network of tiny blood vessels or capillaries. The red corpuscles in the blood exchange the carbon dioxide waste, or as it is sometimes called, carbonic acid gas, for oxygen. It will, therefore, be seen that the air inhaled undergoes a radical change. When exhaled, its temperature is increased and it is laden with moisture given off by the lungs, and the carbonic acid gas has replaced the bulk of the oxygen which it contained.

We have briefly described what takes place during one respiration. Multiply this by the number of respirations per minute and the number of cows in the barn, and you will have some idea of the necessity of replacing with pure air the moisture-laden air and poisonous gases given off.

Plenty of statistics could be shown to prove that the amount of oxygen taken out of the air once exhaled makes it absolutely unfit to be again inhaled until it has been mixed with a fresh supply of pure air.

Amount of Air Breathed Daily by Different Animals

	Lbs.	Cu. ft.
Horse	272	3,401
Cow	224	2,804
Pig	89	1,103
Sheep	58	726
Hen	2	29

Another Need for Ventilation

Aside from the bringing in of pure air to replace the oxygen being used up, a ventilation system is essential for removing the moisture thrown off by the cattle.

It is estimated that approximately ten pounds of moisture, in the form of an invisible vapor, is given off by each animal per day. With a herd of forty cows this would mean four hundred pounds of moisture every twenty-four hours that must be disposed of.

This vapor, if allowed to remain, will condense into moisture on the walls and ceiling of the barn.

One of the best evidences of a poor ventilation system is the frost which forms on the inside of the stable, caused principally by the fact that the moisture exhaled is not being carried off.

This moisture tends to decay the building and helps to contribute to the cold, damp, insanitary condition.

In addition to the moisture given off by the animal, it must be remembered that the incoming air is also moisture-laden.

To prevent condensation, it means that there must be an adequate and continuous movement of air. To give you some idea of the problem to be contended with, we show below another table which states the required number of feet of air per hour and per head, which must pass through the stable, to prevent condensation of moisture when it enters the stable 75% saturated and leaves it saturated at the stable temperature.

If the outside air is 75% saturated at the temperature of	When the stable temperature is: 30°	40°	50°	60°	70°
	The volume of air per head and per hour must be: Cu. ft.	Cu. ft.	Cu. ft.	Cu. ft.	Cu. ft.
0°	1,982	1,253	832	554	402
10°	2,334	1,385	887	569	415
15°	2,620	1,489	931	614	424
20°	3,140	1,634	996	638	434
30°	6,228	2,201	1,165	715	466
40°		4,268	1,566	842	520
50°			1,782	1,126	655

And it must be remembered that the foul air, ammonia and gasses which arise from the manure, if not carried off, would in themselves, contaminate the air in the barn to such an extent that it would be unfit to breathe, even if it contained the necessary amount of oxygen.

Authorities agree that the air in stables should not contain more than 3.3% of air once breathed. This means that with an ideal ventilation system, the air in the stable is maintained, as nearly as possible, equal in purity to that outside.

The Kinds of Ventilation

There are primarily two kinds of ventilation forced and natural.

Forced ventilation is only necessary in office buildings, factories, theatres and such places where an artificial suction is the only means by which the impure air can be removed.

This system for dairy barns would not only be expensive, but unnecessary.

The theory as worked out by Professor King, formerly of the University of Wisconsin, is the basis today, either in its original form, or with such modifications as later experiments have proven advisable, for all natural ventilation systems.

We have dwelt at length on the subject of why to ventilate, without entering into a technical explanation or submitting statistics.

As applied to a dairy herd it is merely a matter of dollars and cents. The less pure air given to the animal, the more water and feed required. To properly fatten cattle or to keep them in a healthful condition without an adequate supply of pure air is next to impossible. Proper food, plenty of water and, above all, adequate ventilation, are the essentials which keep the production of the dairy herd at its maximum.

The Real Problem of Ventilation

The real problem of ventilation is not WHY to ventilate, but HOW to ventilate.

The intake and outtake flues as well as the cupola itself, must have sufficient capacity. The ideal arrangement is to have the fresh air released in front of the cattle and the foul air taken out near the floor back of the cattle.

While it is true that warm air rises, and as warm air is exhaled, one might get the impression that the impure air would be near the ceiling. The fact is that respired air cooled to a temperature between 70 and 30 degrees is heavier than pure air of the same temperature. This, together with the fact that the foul air and gases rise from the gutters, will explain the reason for having the outtakes extend almost to the floor.

This system permits the fresh, pure air which is released in front of the cows and at the ceiling, to become moderated before reaching them, and at the same time there is a tendency to constantly force the foul air back of the cattle.

To obtain the best results, both intakes and outtakes should be double thickness insulated with paper between, making an airtight construction.

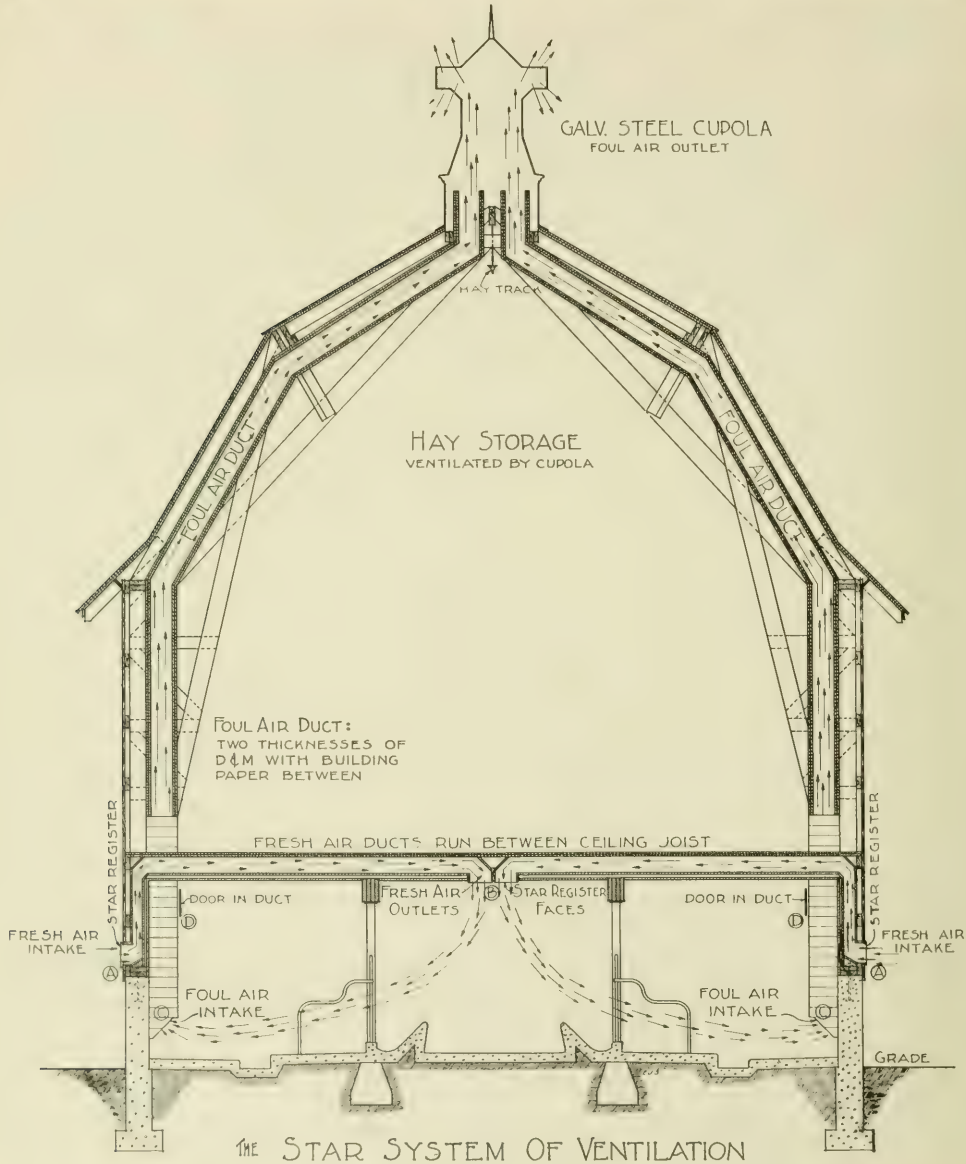
All hay chutes should be kept closed so that the air both coming in and leaving the barn will follow the channels intended.

On the pages which follow, we have illustrated and described at length ventilation systems for the various conditions to be met.

While the foul air outtakes are important they are no more important than the cupola into which the foul air flows.

STAR Steel Cupolas were designed with a knowledge of the conditions to be met. The wind blowing through the opening creates a suction or up-draught. This design prevents a down-draught which would defeat the object for which the entire system was designed.

STAR Steel Cupolas are illustrated and described on pages 84 to 86.



THE STAR SYSTEM OF VENTILATION

COWS FACING IN

Ventilation System for Dairy Barn Where Cows Face In

THE illustration opposite shows a cross section of a dairy barn arranged to accommodate two rows of cattle facing each other.

With this arrangement, the best way to ventilate the dairy barn is to have the large out-take flues, or foul air shafts, arranged as indicated. These out-take flues should be built so that they extend straight up to the roof line and follow it to the cupola or ventilator. They should be spaced so that no point of the barn will be more than 30 feet distant, as practical tests have shown that this is the greatest distance where these flues can be depended upon to draw efficiently.

Out-take flues should start from 12 to 18 in. from the floor so that the damp, heavy, foul air, moisture and gasses will be drawn out rather than the warmer air. This gives the fresh air entering the barn an opportunity of becoming moderated through contact with the warmer air, nearer the ceiling, before it reaches the cattle.

The illustration brings out clearly the fact that the fresh air should enter the intakes from three to four feet lower than the point where it flows into the barn. This arrangement guarantees the flow of air into the barn rather than a tendency for the warm air to leave through the fresh air intakes.

The intakes should be evenly distributed around the building to force general distribution of the fresh air as it enters the barn so that all of the animals may share alike in its benefits.

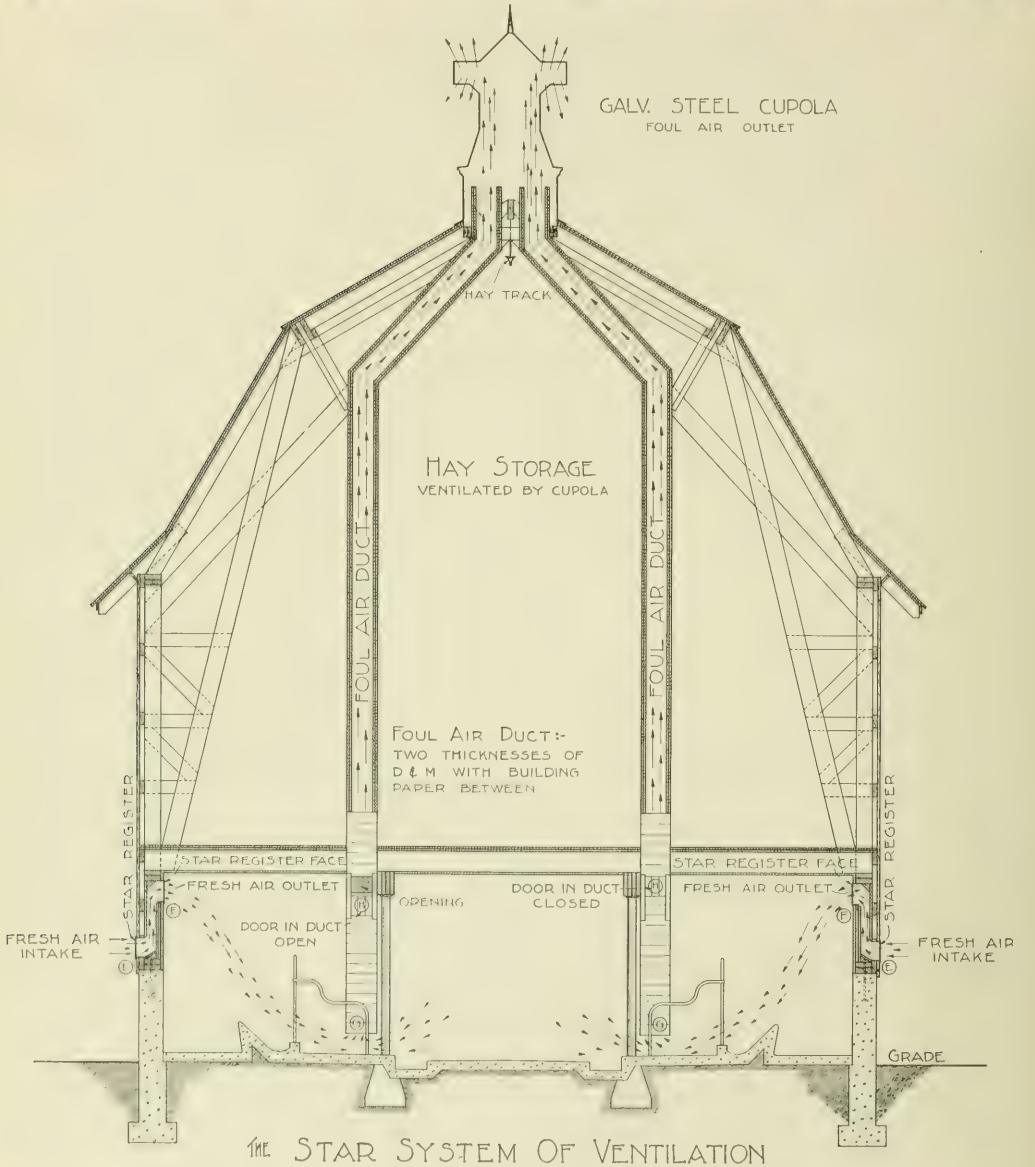
Note from the illustration that the fresh air intakes must be extended to the center of the barn so that the fresh air is released in front of the cattle and so that the pressure has a tendency to force the foul air and gasses back toward the foul air out-takes.

Size and Number of Intakes

The fresh air intakes should be a trifle over one-half square foot in area. Arrange for two for every five cows. To be exact, figure thirty-two square inches of intakes for each cow and forty square inches for each horse. These intakes should be distributed about the barn not more than ten to twelve feet apart to get the best results.

Keep in mind that the combined area of the intakes should exceed the combined area of the outlets by from five to ten per cent. This gives a pressure from the outside slightly greater than the capacity of the outlets, which tends to increase the velocity of the up-draft.

Details of the construction of both intakes and outlets are given on pages which follow.



THE STAR SYSTEM OF VENTILATION

COWS FACING OUT

Ventilation System for Dairy Barn Where Cows Face Out

ON the opposite page is shown an illustration of a cross section of a dairy barn, arranged to accommodate two rows of cattle facing out.

With this arrangement, the best way to ventilate the dairy barn is to have the large out-take flues or foul air shafts arranged as indicated. These out-take flues should be built so they extend as nearly straight up to the roof line as possible in order to keep friction or resistance at the lowest point. These out-take flues should be spaced, if possible, so no point of the barn will be more than 30 feet distant. Practical tests have shown that this is the greatest distance at which these flues can be depended upon to draw efficiently.

You will note that these out-takes are located either in line with the cattle or back of them, if possible, so that at no time does the foul air have to travel in front of the cattle to make its escape. The out-takes should start from twelve to eighteen inches from the floor so the damp, heavy, foul air, moisture and gasses will be drawn out rather than warm air. This gives the fresh air entering the barn an opportunity of becoming moderated through contact with the warm air nearer the ceiling before it reaches the cattle.

The illustration brings out clearly the fact that the fresh air should enter the intake E from three to four feet lower than from the point where it flows into the barn F. This arrangement guarantees the flow of fresh air into the barn rather than a tendency for the warm air to leave through the intakes.

The intakes should be evenly distributed around the building to force general distribution of the fresh air as it enters the barn so that all the animals share alike in its benefits.

Note from the illustration that the intakes E release the fresh air in front of the cattle and at the ceiling F so that the pressure has a tendency to force the foul air and gasses back toward the foul air out-takes.

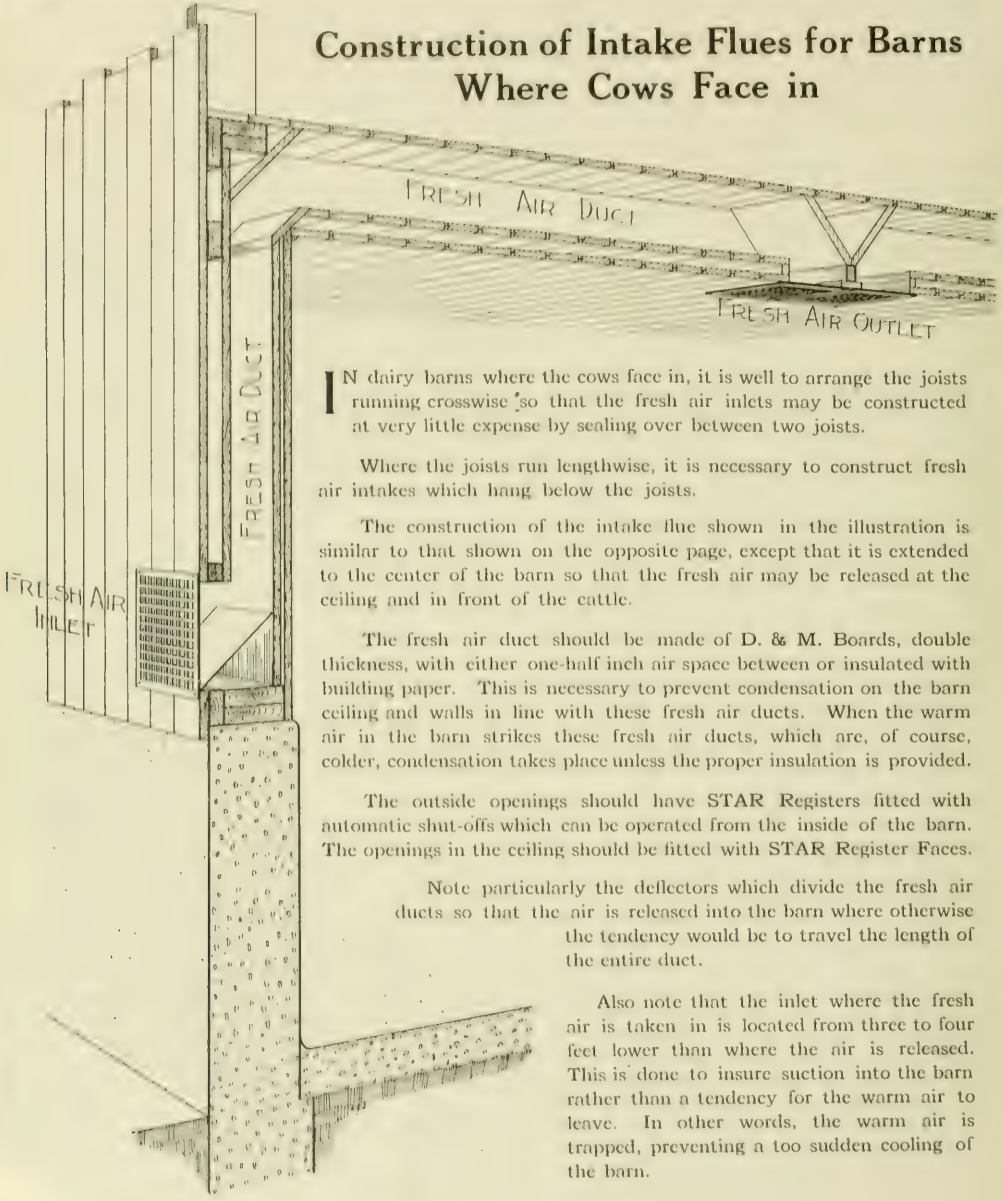
Size and Number of Intakes

The fresh air intakes should be a trifle over one-half square foot in area. Arrange for two for every five cows. To be exact, figure thirty-two square inches of intakes for each cow and forty square inches for each horse. These intakes should be distributed about the barn not more than ten to twelve feet apart to get the best results.

Keep in mind that the combined area of the intakes should exceed the combined area of the out-takes by from five to ten per cent. This gives a pressure from the outside slightly greater than the capacity of the out-takes, which tends to increase the velocity of the up-draft.

Details of construction of both intakes and outlets are given on the pages which follow.

Construction of Intake Flues for Barns Where Cows Face in



IN dairy barns where the cows face in, it is well to arrange the joists running crosswise so that the fresh air inlets may be constructed at very little expense by sealing over between two joists.

Where the joists run lengthwise, it is necessary to construct fresh air intakes which hang below the joists.

The construction of the intake flue shown in the illustration is similar to that shown on the opposite page, except that it is extended to the center of the barn so that the fresh air may be released at the ceiling and in front of the cattle.

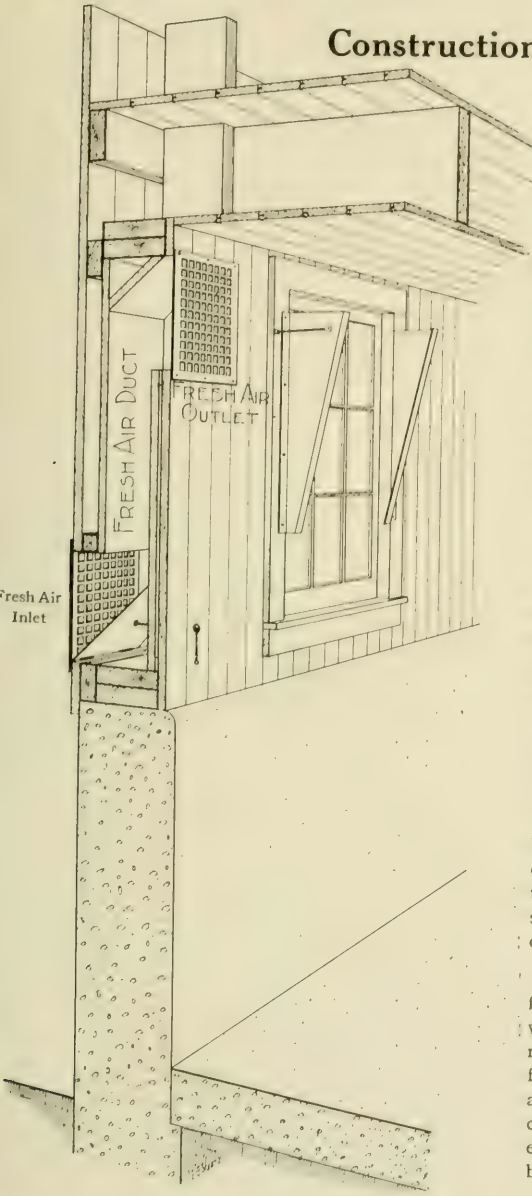
The fresh air duct should be made of D. & M. Boards, double thickness, with either one-half inch air space between or insulated with building paper. This is necessary to prevent condensation on the barn ceiling and walls in line with these fresh air ducts. When the warm air in the barn strikes these fresh air ducts, which are, of course, colder, condensation takes place unless the proper insulation is provided.

The outside openings should have STAR Registers fitted with automatic shut-offs which can be operated from the inside of the barn. The openings in the ceiling should be fitted with STAR Register Faces.

Note particularly the deflectors which divide the fresh air ducts so that the air is released into the barn where otherwise the tendency would be to travel the length of the entire duct.

Also note that the inlet where the fresh air is taken in is located from three to four feet lower than where the air is released. This is done to insure suction into the barn rather than a tendency for the warm air to leave. In other words, the warm air is trapped, preventing a too sudden cooling of the barn.

Construction of Intake Flues for Barns Where Cows Face Out



THE construction of the intake flue or fresh air duct where the cows face out is comparatively simple. A box comstructed of 1 in. x 6 in. D. & M. boards, built in between the studding answers the purpose nicely. To avoid condensation on the inner wall in line with the fresh air intake, double thickness boards should be used with a one-half inch air space between, or with building paper for insulation.

The outer opening of the flue or duct should be a little larger than the flue itself. It should be covered with a STAR Register fitted with an automatic shut-off so that the volume of fresh air taken in can either be regulated or shut off if necessary.

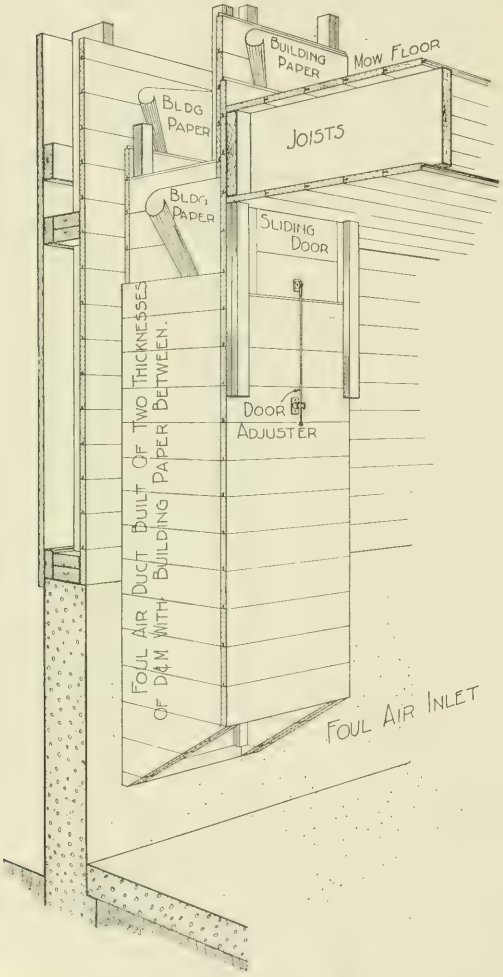
The inner opening should be the same size as the outer opening. It should be covered with a STAR Register face. You will note that where the cattle face out, the fresh air is released at a point from three to four feet higher than where it enters the inlet and as near the ceiling as possible, directly in front of the cattle.

Ventilation can be increased by having the windows fitted with STAR Window Guards. When the windows are opened, they drop back into the guards which in turn deflect the air to the ceiling, allowing it to become moderated before reaching the cattle. Details of window construction are given on page 138. Note that the window illustrated is so designed that for summer ventilation it can be raised from below or entirely removed.

Where the masonry wall extends to the mow floor, it is at times advisable to locate the windows in pairs with a mullion between. This mullion should be large enough to serve as the fresh air intake. This makes a very desirable arrangement to take care of this condition because the fresh air inlet is located in between each pair of windows and does not have to be built into the masonry.

Construction of Out-take Flues

ON the out-take flue depends, to a great extent, the success or failure of the ventilation system. This flue preferably should be square or round in cross section. It must be constantly kept in mind that the straighter the flue, the less friction. The cross sectional area should be maintained the entire length of the flue. For example: if the flue, at the start, were the proper size and were decreased in size going through the mow, the capacity would be correspondingly decreased.



This flue should be constructed of matched boards, double thickness and insulated with paper. It is essential that this construction should be as near air tight as possible. If care is not taken on this point, then the efficiency will be correspondingly decreased.

It is advisable to locate these foul air out-takes so that no point of barn will be more than thirty feet distant. This is the greatest distance where the out-take flue can be depended upon to draw efficiently.

It is well to locate a sliding door near the ceiling practically the same size as the opening below, so that during the summer months when the barn becomes too warm or too damp, the warm, damp air can be released quickly.

Of equal importance to the out-take is the cap or ventilator on the roof. STAR Steel Cupolas are

Construction of Out-take Flues

(Continued)

scientifically designed and are more efficient than wooden cupolas. Not only that, they are lighter and their construction guards against a down draft. It is important that a cupola should extend at least three feet above the ridge of the barn or any surrounding barns if the best results are obtained.

The principle is just the same as that of a chimney and if the requirements of an efficient chimney are kept constantly in mind it will aid greatly in constructing these out-take flues.

The preceding pages have covered in as brief and concise a manner as possible, the fundamental principles of ventilation. These principles are those on which recognized authorities agree and on which all successful ventilating systems are based.

From the explanations given and the illustrations shown, a practical system of ventilation can be figured out to suit any ordinary requirements.

There may be special cases, not covered in the suggestions outlined. But THERE IS ALWAYS A WAY TO VENTILATE, and to take care of such cases we shall be glad to have you call upon our BARN PLAN DEPARTMENT for advice and co-operation. This department has made a thorough study of ventilation from a practical standpoint and is prepared to assist you in every way possible in figuring out problems of ventilation as well as barn equipment.

Size of Out-take Flues

Due to the variance in humidity, temperature, height of duct and velocity of wind, it is difficult to outline a cut-and-dried formula for figuring the size of out-take flues which will apply under different climatic conditions, etc. However, most authorities will agree that a safe rule to follow is to allow thirty-two square inches of area for each cow and forty square inches of area for each horse. For example: in a barn stabling ten cows and two horses, the combined area of the out-take flues should equal about four hundred square inches. In other words, a flue twenty inches square, inside measurements, would be ample.

Where conditions arise making sharp angles or bends necessary, the area of the flue should be increased to offset the loss of efficiency due to friction.

When the flue has to be flattened somewhat, so that its shape is neither round nor square, the area should be relatively greater.

This rule is as practical a basis on which to figure as any that has yet been established.

Have Your Barn Built on Paper First

WE are equipped to produce and supply plans for Modern Dairy Barns and other farm buildings. At the head of this department are experienced men who for years have been designing barns for leading dairymen throughout the country. They are experienced in the field of barn construction and engineering.

This department furnishes:

1. Floor Plans.
2. Complete Working Plans.
3. Complete Specifications.

We furnish, without charge, complete floor plans. These plans are blue printed, drawn to exact scale and cover our recommendation in each individual case according to the conditions and requirements. On these floor plans, we show accurately the location of each door and window, also the arrangement of all stalls, pens, bins, ventilating chutes, feed and litter alleys, etc.

We also furnish at a nominal charge, complete blue printed working plans in addition to floor plans. These working plans show drawings of all elevations, cross-sections showing construction of foundation walls, floors, side walls and height of ceilings and cross sections of framing, showing size and lengths of rafters, joists, studding, braces and all other lumber used and how same is joined together.

Also all detailed drawings are provided showing construction of windows, doors, cornices, ventilating flues—both intake and out-take—hay chutes, etc.

Complete specifications are also furnished with each set of plans where desired.

We submit herewith a number of practical Dairy and All-Purpose Barns intended to cover the ordinary range of requirements. Choose the design of barn that best suits you. Send to us for the floor plans or complete plans and specifications. Floor plans are free. The nominal charge made for complete plans and specifications will be refunded upon the purchase of STAR Equipment.

Or, if you wish us to furnish complete special plans for a barn of unusual character or design, we will do so at a cost commensurate with the work involved.

In any event, you can bring your building problems to this department with the assurance that you will get the most expert authoritative advice, and that the plans submitted will be scientifically correct and in accordance with the best principles of modern barn construction.



Star Dairy Barn No. 1

36 ft. wide, 126 ft. long, and approximately 44 ft. from grade to ridge.

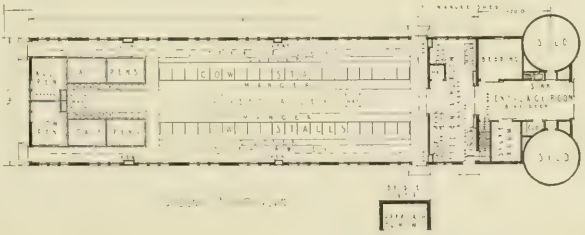
It has a feed room accommodation at the end, 36 ft. wide and 20 ft. long. The driveway to mow floor simplifies the unloading of hay and straw. Grain bins located above the mixing room can be filled directly from wagon and grain can then be spouted to the mixing room on ground floor. Hay mow capacity is 217 tons.

The ground floor is planned to accommodate 40 cows, 4 calf pens, a cow pen, and a bull pen. The cows face in, with a broad feed alley down the center.

Ground floor height is 8 ft. 6 in. The entire ground floor and foundation walls are of concrete. Foundation walls extend to the level of window sills. The construction is a plank frame with a trussed roof, as illustrated on page 146. The exterior walls of ground floor are covered with horizontal drop siding and vertical siding is used above mow floor.

This is a beautiful as well as a practical, modern milk factory. It is well lighted, well ventilated, has ample storage capacity, and a business end in which the largest amount of work can be handled with a minimum of effort.

It is a type of barn that can be built and STAR Equipped complete at reasonable cost.

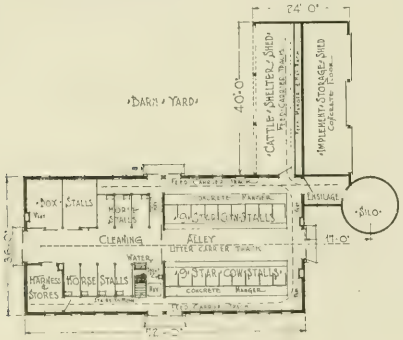




Star General Purpose Barn No. 2

36 ft. wide, 72 ft. long and 38 ft. high from grade to ridge. The cattle shelter and implement shed is built at the silo end, 24 x 40 ft.

This barn is of the braced rafter type of construction, as shown on page 152. It is a well constructed building with no posts in mow to interfere with the unloading of hay. The floor and foundation up to the window sills are of concrete. The frame walls are sided with horizontal drop siding, making a very neat appearing structure. Hay mow capacity is 100 tons.



It is planned to accommodate 18 cows, and 9 horses, including two box stalls.

The stock face out, which gives an 8 ft. driveway in the center for manure spreader.

In the horse stable a harness room has been provided in which harness can be hung and various supplies kept.

A concrete floor in the cattle barn extends 4 ft. beyond the building—a feature which the farmer will appreciate.

The implement shed has been well designed for the convenient handling of farm implements.

This barn and annex form a very complete and convenient farm group.

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Star General Purpose Barn No. 3

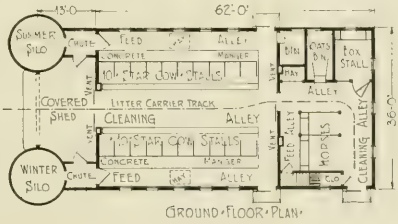
36 ft. wide, 62 ft. long and 38 ft. from grade to ridge, with a shed addition, 36 ft. wide and 13 ft. long.

In this plan provision is made for the stabling of horses across one end. There are three horse stalls and a box stall. The cow barn is partitioned off from horse barn, and accommodates 20 cows. Cows face out.

The oats bin and hay chute are conveniently planned. The small bin is filled directly from the larger bins located on the mow floor. Hay is elevated from the outside. Access to mow is by a stairs in horse barn. Hay mow capacity is 86 tons.

Ceiling height is 8 ft. 6 in. in clear. The entire lower floor and foundation walls are of concrete. Foundation wall extends to the level of window sills. This is a plank frame, Gothic roofed barn with vertical drop siding. It is especially well planned, lighted and ventilated. Bins and silo are so located that feeding can be done quickly and with a minimum of effort.

The construction of this barn is simple, and requires no expensive labor to build. The mow is large and unobstructed, and the graceful curve of the roof affords the best possible drainage. This is an unusually beautiful barn, yet less board feet of lumber are required to build it than any other type of construction.





Star General Farm Barn No. 4

36 ft. wide, 98 ft. long and 42 ft. from grade to ridge.

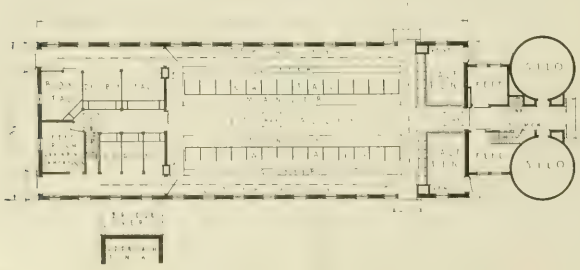
The interior arrangement of the cow barn provides for 28 cows, facing in, and two calf pens accommodating 12 calves. Feed bins are built next to the silo with larger bins overhead.

The horse barn contains 3 single and two double horse stalls, and a box stall. A feed room with overhead bins is located in the horse barn.

The concrete foundation wall extends up to the mow floor level. Barn has a concrete approach for the convenient handling of grain and hay, directly on the mow floor. The barn above the concrete wall is of a STAR plank frame, trussed roof construction, similar to the barn shown on page 146. The frame walls are covered with vertical drop siding. Hay mow capacity, 145 tons.

Special attention has been given to the planning of lighting and ventilation in this barn. It has all the advantages, but none of the objectionable features of the dark, damp, old fashioned bank barn.

This is the kind of barn that answers the requirements of thousands of American farmers. As you can see from the floor plan, it is designed to save the greatest possible amount of labor. The feeding alley runs out from the feed room, thus shortening the distance between cows and feed and saving thousands of steps throughout the year. Complete STAR Equipment makes the work in the barn a real pleasure.





Star General Purpose Barn No. 5

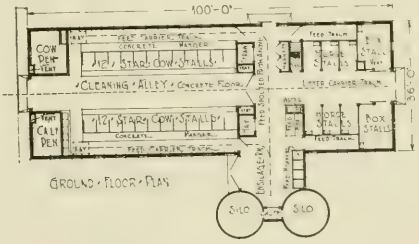
36 ft. wide, 100 ft. long and 38 ft. from grade to ridge.

The feed room and silo are built on one side. This arrangement permits the farmer to increase his barn in its length as required. Grain bins are located on mow floor. The width of doors to ensilage room gives access to wagon load of roughage which can then be distributed down the feed alleys.

The ground floor of cow barn is planned to accommodate 24 cows, a calf pen and a cow pen. The wide feed mixing floor separates the horse barn from the cow barn. 8 horses are stabled in 6 single stalls and 2 box stalls. The stock face out and a wide center driveway will permit the driving through with a manure spreader, if desired.

The barn is of a plank framed, braced rafter construction. The exterior walls are covered with horizontal drop siding. Hay is elevated from the outside and the mow is lighted and ventilated by dormer windows. Hay mow capacity is 144 tons of hay.

This general farm barn has been especially designed to meet the needs of the farmer on a 200 to 250 acre farm, and who desires a good substantial building at a minimum outlay of capital.



GROUND FLOOR PLAN



Star Dairy Barn No. 6

34 ft. wide, 110 ft. long and approximately 30 ft. from grade to ridge.

It is a barn that should appeal to the thinking farmer, the wide awake dairyman who knows that a comfortable, sanitary building is the only kind of barn he can afford to put his money into.

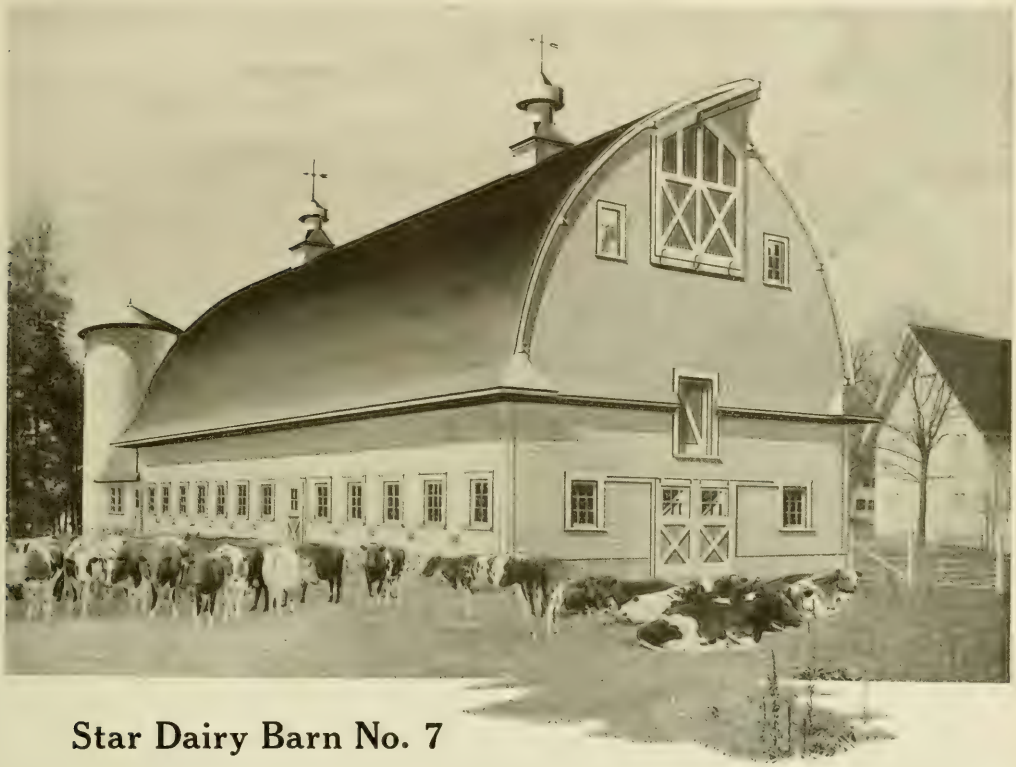
A herd of 36 milch cows comfortably stabled in STAR Steel Stalls; two calf pens accommodating 12 calves, a cow pen and a bull pen, makes this an ideal and practical floor arrangement. The cows face out, with a driveway through center of barn.

There are four large hoppered bins readily accessible for feeding and filling. Hay is taken in at the end and the unobstructed mow will hold plenty of hay and roughage to feed the herd. Hay mow capacity, 100 tons.



'GROUND 'FLOOR 'PLAN'

The ground floor height is 8 ft. 6 in. in the clear. The foundation wall is of concrete and extends 6 in. above the grade. The exterior walls are built of hollow tile to the plate and stuccoed. The roof is the braced rafter type, illustrated on page 152.



Star Dairy Barn No. 7

36 ft. wide, 98 ft. long and 39 ft. from grade to ridge.

There are two large silos attached to a shelter shed, 36 ft. wide and 21 ft. long. The grain bins are located above and grain is spouted to ground floor.

This is a distinctive building that will add tone to any farm. It is not a novelty, but a barn combining all the good features of a rectangular barn, and the beauty, strength and economy of a round roof.

It has stall accommodations for 30 cows. The pen barn is separated from the milking barn by a tight partition, and contains two calf pens, two cow pens, a maternity pen, and a bull pen. The stock face out and a wide, center driveway will permit the driving through with a manure spreader, if desired.

The foundation wall and first floor are of concrete. The foundation wall extends 2 ft. above grade. The ground floor height is 8 ft. 6 in. All framing lumber is of 2 in. material. Drop siding is used on the outside of walls. The beautiful Gothic roof, entirely free from supporting timbers, makes a hay mow where hay can be handled with a minimum amount of labor.

Hay mow capacity is 139 tons.





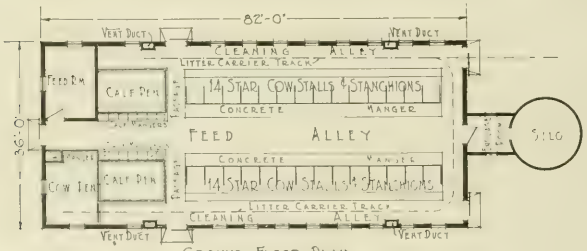
Star Dairy Barn No. 8

36 ft. wide, 82 ft. long. The interior arrangement provides for the stanchioning of 28 cows, headed in. Two pens accommodating 14 calves, a cow pen, and a well located feed room complete the plan.

The entire lower floor and foundation walls are of concrete. The foundation wall extends 2 ft. above the grade. Ceiling height is 8 ft. 6 in. in clear. The outside walls are covered with horizontal drop siding.

The dairyman who desires to have his feed and hay stored in a separate building will like this barn. It is planned according to the best practices of dairying, and is equipped with all modern labor-saving devices. It is well lighted, and well ventilated. It is smooth and sanitary on the inside, and especially pleasing in appearance.

This barn, completely equipped with STAR Equipment, could be made a highly productive milk factory.



· GROUND · FLOOR · PLAN ·



Star Dairy Barn No. 9

36 ft. wide, 70 ft. long and has a feed room annex 20 ft. wide and 20 ft. long.

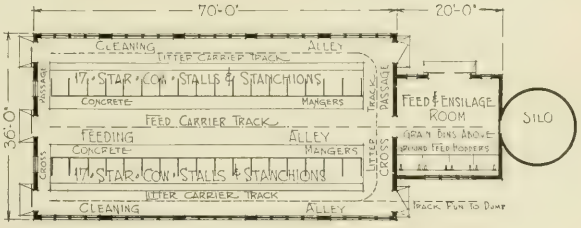
Grain bins are located on second floor of feed room and grain is spouted to hoppers below.

There are two rows of cows, facing in, with cross alleys at the ends of stall rows.

The entire ground floor and the foundation walls extending to the level of the window sills, are of concrete. The building above foundation wall is rigidly framed and trussed. The exterior walls are covered with drop siding.

This Monitor roofed dairy barn is adapted to Southern, or Californian conditions only.

It is especially well lighted, and sash are so arranged that they can be readily removed and blinds or screens attached. Owing to climatic conditions, this barn has no ventilation system. The windows and louvers in Monitor are depended upon for a thorough circulation of air.



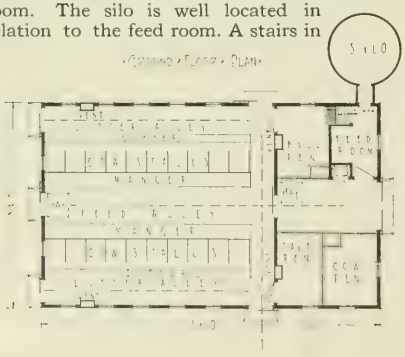
GROUND FLOOR PLAN



Star Dairy Barn No. 10

34 ft. wide, 56 ft. long and 36 ft. from grade to ridge.

There are stalls for 20 dairy cows, facing in. One end of barn is partitioned off and divided into a calf pen, a cow pen, bull pen and feed room. The silo is well located in relation to the feed room. A stairs in feed room gives access to the mow. Hay is elevated from the outside. The grain bins on mow floor can be filled by a bucket elevator located in the driveway.



The floors are of concrete. The ceiling height is 8 ft. 6 in. in clear. The foundation walls are of concrete extending up to the level of window sills.

The braced rafter, trussed frame barn, illustrated on page 152, is the type of construction used. All framing lumber is of 2 in. material, well braced, and thoroughly bolted. The mow floor is supported by STAR Steel Posts. The exterior walls are covered with horizontal drop siding. Hay mow capacity 80 tons.

This barn is modern from every viewpoint. It allows an abundance of sunshine to flood the gutters, and disinfect them daily. It is well ventilated and is easily kept in sanitary condition. The STAR Litter Carrier and Boom shown in the illustration show how to make short work of the litter problem.



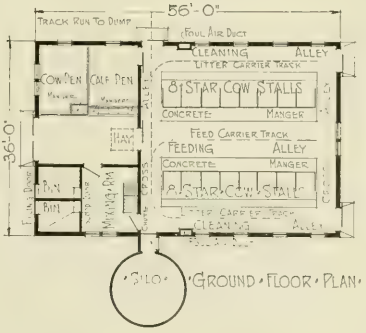
36 ft. wide, 56 ft. long and 43 ft. high from grade to ridge.

This barn is planned to accommodate 16 cows, facing in, a cow pen and a calf pen. The mixing room is located right next to the silo and grain bins. With a STAR Overhead Carrier system, the cattle can be fed conveniently and quickly.

The foundations and floors are of concrete. The ceiling is 8 ft. 6 in. high. The barn above foundation is a plank frame, trussed roof barn of the same construction as the building shown on page 146. The mow is especially high, and will take care of a bumper crop. Its capacity is 88 tons.

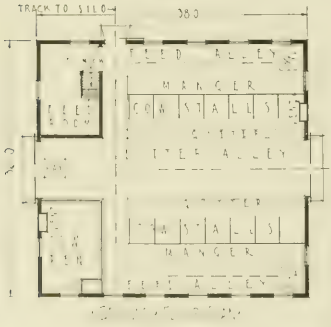
This is a roomy and convenient barn, well ventilated, with wide feed and grain alleys and with cross alleys well located. The combination of horizontal siding below hay mow floor, and the vertical siding above, broken by a well designed belt course, gives this barn both a pleasing and substantial appearance.

Star Dairy Barn No. 11





Star Dairy Barn No. 12



36 ft. wide, 38 ft. long and 34 ft. from grade to ridge. It is a practical, simple and economical barn, well lighted and well ventilated and is especially suited to the needs of dairymen having a medium sized herd.

It provides quarters for 14 dairy cows and a cow pen. The cows face out, which is a very convenient arrangement in a barn of this size. The stairs to the mow is located in the feed room. Feed bins are located on mow floor and feed is spouted to ground floor level. Hay is taken into barn through a large gable door. The hay mow is unobstructed by any supporting timbers. Capacity of hay mow is 40 tons.

The ceiling is 8 ft. 6 in. high. The foundation is of concrete and extends 2 ft. above grade. The barn is of a STAR Plank frame, braced rafter type. The mow floor is supported by STAR Steel Posts. Outside walls are covered with drop siding.

A barn like this can be made a pleasant place to work in with a complete STAR Equipment.



Star Dairy Barn No. 13

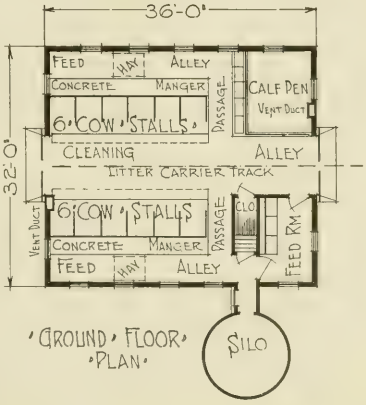
32 ft. wide, 36 ft. long and 32 ft. high. Its plan is similar to the barn shown on the opposite page.

There are 12 cow stalls, facing out, and a large calf pen accommodating 5 calves. One corner of the barn is devoted to a feed room with a silo attached. A stairway to the mow runs up from the passageway right next to the feed room. Under the stairway there is a closet for utensils. Hay mow capacity is 36 tons.

The ceiling height is 8 ft. 6 in. in clear. The ground floor and foundation are of concrete. The foundation wall extends 2 ft. above grade.

This barn is a STAR plank frame, braced rafter barn, the same as illustrated on page 152. It is a small, compact dairy barn, embodying all the essential features of the bigger plant.

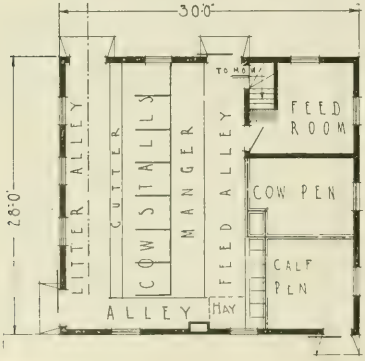
You can make this barn a very profitable one with STAR Equipment.



GROUND FLOOR PLAN



Star Dairy Barn No. 14



28 ft. wide, 30 ft. long and approximately 29 ft. high from grade to ridge.

There are stalls for a herd of 7 cows. Also a cow pen and a calf pen. Access to the hay mow is by a stairs conveniently located near the feed room. Feed can be stored in bags or spouted from an overhead bin.

Ground floor height is 8 ft. 6 in. in clear. Ground floor and foundation walls are of concrete. The foundation wall extends 2 ft. above grade.

The construction is of the plank frame, braced rafter type shown on page 152. The exterior walls are covered with horizontal drop siding. The barn is well lighted and ventilated by a STAR Automatic System of ventilation. The studs, sills, plates and rafters are of 2 in. x 6 in. material. Joists are of 2 in. x 8 in. supported by two built-up girders. STAR Steel Supporting Columns are specified. Hay mow capacity, 20 tons.

This well proportioned barn can be completely equipped with STAR equipment at an unusually low cost.



Star Combination Horse and Dairy Barn No. 15

36 ft. wide, 70 ft. long and 38 ft. high from grade to ridge.

There are six single, four double and two large box stalls. Horses face in. Underneath the driveway to the mow is a root cellar with a trap door to the driveway. Grain bins located in the mow can be readily filled from wagon, and the grain spouted to small bins in the mixing room. The milking machine room is well located in relation to the Dairy Barn.

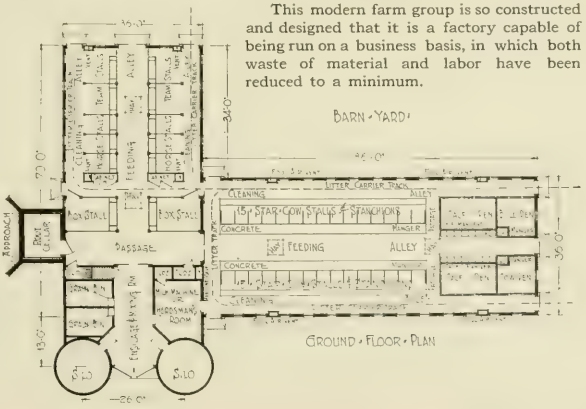
The dairy barn is 36 ft. wide, 86 ft. long and 30 ft. high from grade to ridge and is planned to accommodate 30 cows. It also contains two calf pens, a cow pen and a bull pen. Cows face in.

The horse barn is a plank frame, trussed roof barn with horizontal drop siding. The dairy barn is a plank frame, braced rafter barn with horizontal drop siding.

The entire lower floor and foundation walls are of concrete. The foundation wall extends to the level of the window sill. Both the horse barn and dairy barn are well lighted and ventilated. The mows are well lighted by well proportioned dormer windows.

Enough hay, straw, grain and roughage can be stored to fully meet the feeding requirements of the stock. Combined mow capacity is 170 tons of hay.

This modern farm group is so constructed and designed that it is a factory capable of being run on a business basis, in which both waste of material and labor have been reduced to a minimum.





Star General Purpose Barn No. 16

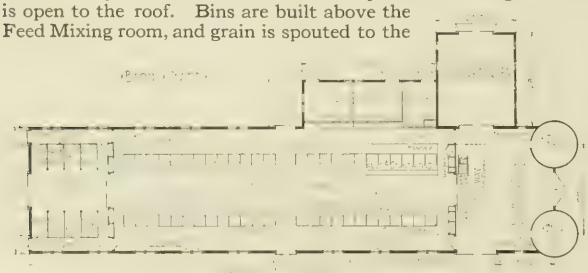
38 ft. wide, 140 ft. long and 42 ft. from grade to ridge.

The feed room annex at the silo end is 38 ft. wide, 17 ft. long and 34 ft. high.

The barn has stalls for 50 dairy cows, facing out, two calf pens, a bull pen, and a general purpose room, well planned, at the barn yard side of the barn. There is a tight partition between the horse and cow barn. The horse barn will accommodate eight horses, in single stalls. Hay is elevated from the driveway which is open to the roof. Bins are built above the Feed Mixing room, and grain is spouted to the ground floor. The hay capacity is 245 tons.

The ground floor and foundation walls are of concrete. The ceiling height is 8 ft. 6 in. in the clear. This barn is a STAR plank frame, trussed roofed barn, of the type illustrated on page 146. The long rooflines are broken by dormer windows which scale in well with the main barn.

In this modern farm barn waste motion, waste material, and waste labor have been eliminated. Things move in a straight line and in one direction—there are few corners to turn and no steps to retrace.



The finishing touch to a barn like this would be to make it STAR Equipped throughout. This means not only STAR Stalls and Stanchions, but also STAR Steel Pens, STAR Water Bowls, STAR Litter and Feed Carriers, STAR Door Hangers, Hay Tools etc. A STAR Equipped Barn is a work-saving building.

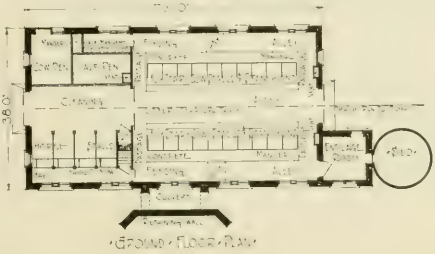


Star General Farm Barn No. 17

38 ft. wide, 70 ft. long and approximately 37 ft. from grade to ridge. A small ensilage room is built adjacent to the silo. The cow barn is partitioned off from the horse and pen barn. There are stall accommodations for 20 milch cows, 4 single horse stalls, a cow pen and a calf pen. The stock face out. An enclosed stairway to mow is planned in relation to the driveway above. A spreader can be driven through the barn. Bedding and roughage can be brought into the barn through the same driveway.

The foundation walls are built of local field stone. The ceiling height is 8 ft. 6 in. in the clear. This type of gable barn is a favorite in certain sections of Pennsylvania, Ohio and Indiana. It has all the good features of the old timber framed barn, but is modern in construction. The frame is built of plank and the roof is supported by trusses.

Hay mow capacity is 85 tons of loose hay.



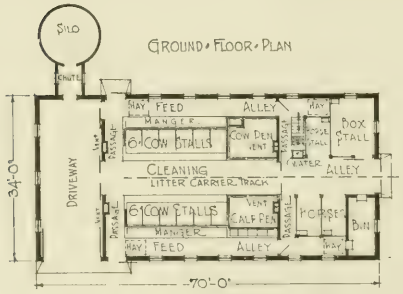


Star General Purpose Barn No. 18

34 ft. wide, 70 ft. long and 36 ft. high from grade to ridge.

There is a wide driveway on the silo end from which hay can be unloaded into the mow. Driveway is separated from the rest of the barn by a tight partition, which prevents the dust from getting into the barn proper.

The barn contains accommodations for 12 cows, a cow pen and a pen for 5 calves. Provisions are made for 4 horses, including a box stall and a grain bin. The stock face out. Hay mow capacity is 76 tons.



The barn is of a plank frame, trussed construction, as shown on page 146. The foundation extends 3 ft. 6 in. above grade, and is of concrete. The frame walls above foundation are sided with vertical siding.

The feed and cleaning alleys are wide and the cross alley is well located. The vertical siding above the high foundation gives this barn a pleasing and substantial appearance.

Here is a roomy and convenient barn. It is well lighted and well ventilated and is outfitted complete with STAR Equipment, which means making it a building in which the greatest amount of work can be accomplished with the least effort.



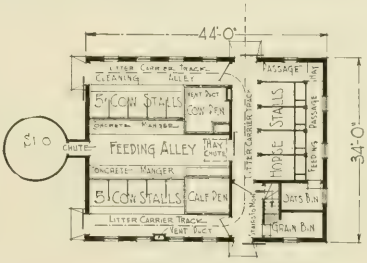
Star General Purpose Barn No. 19

34 ft. wide, 44 ft. long and 37 ft. high from grade to ridge.

Four horses are stabled across one end, separated from the cow barn by a tight partition. The cows face in, and there are stall accommodations for 10 animals, a calf pen and a cow pen. Grain bins placed in one corner are well located for the feeding of stock. The hay chute is centrally located. Access to mow is by an enclosed stairs in feed room. The hay mow capacity is 50 tons of loose hay.

Ceiling height is 8 ft. 6 in. in clear. The ground floor and foundation is of concrete. The foundation wall extends two feet above grade. The construction is a plank frame with a braced rafter roof. The exterior walls are covered with horizontal drop siding.

This general purpose barn is designed to meet the needs and requirements of farmers owning about 80 to 120 acre farms. It is compact in arrangement, especially well lighted and ventilated. It is a type of barn that will form the nucleus of a good set of farm buildings that will prove a credit to the farm and community.



GROUND FLOOR PLAN



Star General Purpose Barn No. 20



30 ft. wide, 36 ft. long and approximately 29 ft. high from grade to ridge.

There are stalls for 5 cows, a cow pen and a calf pen. Three horses are stabled across one end. Access to hay mow is by a stairs conveniently located in the feed room. Feed can be stored in bags, or spouted from an overhead bin. Hay mow capacity is 34 tons of hay.

Ground floor height is 8 ft. 6 in. in clear. Ground floor and foundation walls are of concrete and extend 2 ft. above grade.

The construction is of the plank frame, braced rafter type, shown on page 152. The exterior walls are covered with horizontal drop siding. The barn is well lighted and ventilated by a STAR System of ventilation.

The studs, sills, plates, and rafters are of 2 in. material. Joists are supported by two built-up girders. STAR Steel Supporting Columns are specified.

There are a number of small farms where a barn of this type will furnish all the accommodations needed—a farm where the owner does all the work and wishes to keep but few cows and horses.



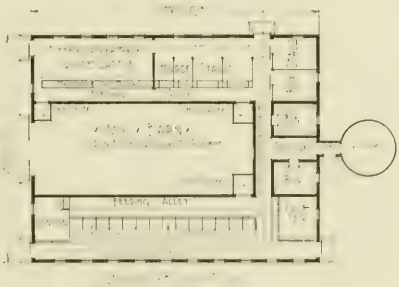
Star All-Purpose Barn No. 21

60 ft. wide, 76 ft. long and 37 ft. from grade to ridge.

This barn is especially designed for the keeping of the dual purpose herd. A barn of this size and shape will take care of the average farmer's needs. Almost a car load of beef cattle are sheltered along one side, partitioned off from the horse barn. Horse barn accommodates two team stalls, two single stalls, and two box stalls. Ten dairy cows, a calf pen and a cow pen are housed in the opposite side. Hay is stored in the center of the barn, and over the stock, two grain bins, and a silo complete the plan. Hay mow capacity is 150 tons.

The entire barn is floored with concrete, except the hay barn. The foundation wall is of the same material and extends 2 ft. above grade. The barn is a plank frame structure, and is well braced and trussed. The outside walls are covered with vertical drop siding.

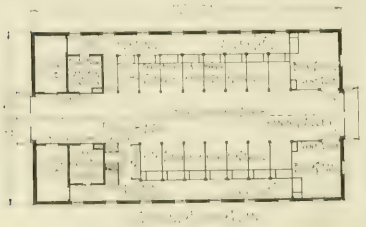
This barn is convenient, practical and economical for the farmer. Everything is centralized here to save labor and make winter feeding easy and profitable. Silage can be easily distributed down the feed alley, hay and other roughage stored in the mow, can be handily fed into the manger, or hay racks, located along the side of the mow.





Star Horse Barn No. 22

40 ft. wide, 72 ft. long and approximately 40 ft. from grade to ridge. This plan shows a practical farm barn especially designed to stable horses. It contains 15 single horse stalls and two large box stalls. Two corn cribs are built across one end and extend up into the hay mow. Two bins can be conveniently filled from the driveway. A spreader can be driven through the barn and manure hauled directly to the field, if desired. Hay is elevated to mow through large gable doors and access to mow is by a stairs adjacent to the feed bin. A harness cabinet built in passage will store two or three good sets of harness. Hay mow capacity is 138 tons of hay.



The ceiling height is 9 ft. in the clear. The floor and foundation is of concrete. Foundation wall extends 2 ft. above grade. The barn is of a plank frame, trussed roof construction. The outside walls are covered with vertical drop siding.

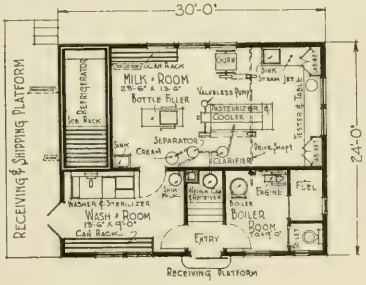
The building serves its purpose best when especially adapted to the purpose intended. A horse barn should be different than any other building on the farm. The health and comfort of the horses should be a first consideration, but the convenience in feeding and attending to their wants should not be forgotten.



Star Farm Dairy House No. 23

THE progressive, wide awake dairyman realizes that in order to produce milk or cream of the best quality, the dairy house must be so constructed and equipped that the products can be cared for in the most convenient and satisfactory manner. To correctly design the dairy house it is essential that the size of the herd, how the product is to be disposed of, the location of the barn, well, etc., be known. However, a few general principles can be followed in the building of any dairy house.

Although the dairy house should be near enough to the barn to be convenient, it should not be directly connected. When selecting the location for the house proper, drainage should be first considered. Any building medium may be selected depending upon the investment the owner wishes to make. Plastered interior walls are preferable to wood walls. The building should be partitioned off, and the rooms should be well lighted and ventilated. A solid and impervious floor of concrete is essential. All floors should be well drained. Lastly an abundance of clean, cold, running water is necessary. The dairy house shown above is amply large to take care of the product of a herd of 30 to 60 cows. The same general plan and layout may be followed for a larger plant by increasing the overall dimensions of the building to accommodate the larger machinery and storage space required.



FLOOR PLAN

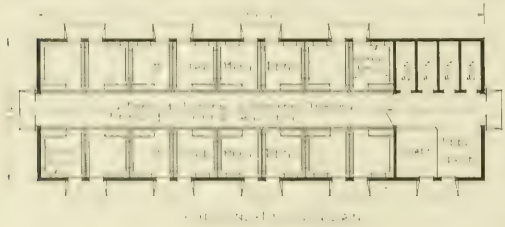


Star Modern Hog House No. 24

EVERY successful farmer and hog raiser in the country is familiar with this type of house. The house is 26 ft. wide and 81 ft. 4 in. long. The height of this type of house is always governed by the latitude in which it is to be built. The illustration shows a house designed for latitude 42 degrees north. There are 16 STAR Steel Hog Pens. Four bins, a scale, and cooking space are located in one end. If desired, this space can be utilized for four more pens. Size of pens are 8 feet x 9 feet. Small doors in side walls give the pigs access to the outside pens.

The foundations and floors are of concrete. The side and end walls are of hollow tile. The roof is exceptionally well framed and is covered with shingles and composition roofing. The ridge of the house should always run east and west, to get a southern exposure. Sunshine—good, warm, clean, wholesome sunshine, is an absolute essential for hog growing success. It means better health and faster growth.

The windows in the house are of a size and so located that the new born pig, farrowed in February or March, will receive a maximum amount of wholesome sunshine. A decided advantage of this type is that the hot, perpendicular rays of the summer sun will not penetrate the interior of this house. Swine are as susceptible to heat as they are to cold, and no other type of house possesses the advantage mentioned above.



Constant repairs and continuous depreciation is eliminated in this modern hog house. With prices assured and unlimited markets the farmer is warranted in disregarding the seeming higher first cost of a permanent tile construction.



Star Combined Corn Crib, Granary and Hog House No. 25

THE combination corn crib, granary and hog house illustrated above, forms a most ideal, practical and economical farm group. The farmer going into pork production will readily appreciate its many merits and labor saving advantages.

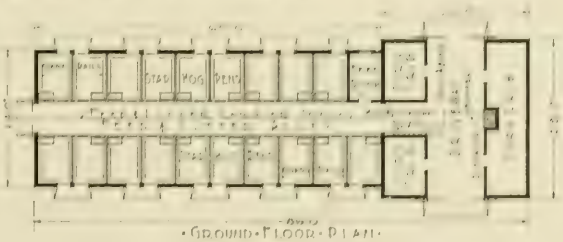
The Corn Crib and Granary

The building is 26 ft. wide and 28 ft. long. The corn cribs are 8 ft. wide and 18 ft. high to the square. A trench runs lengthwise through the cribs, forming a convenient runway for the drag of the corn sheller. Grain bins are located above the 10 ft. driveway, and grain can be spouted to a wagon below. Grain is elevated by a portable elevator. The capacity of corn crib is 2,649 bu. of ear corn, and the bins hold approximately 1,500 bushels of small grain.

This is a modern crib and granary, designed to carry maximum loads. The entire lower floor is of concrete. The plank frame is well braced and covered with standard cribbing.

The Hog House

A house of this type should be built with the ridge running North and South, so that the sun's rays will strike all the pens. The corn crib located at the north end will shelter the house from the prevailing winds. The dimensions of the house are 24 ft. x 60 ft., and it contains 19 STAR Steel Hog Pens, and a feed room. Pens are 6 ft. x 8 ft. Ceiling height is 7 ft. in clear, and hay and roughage can be stored overhead. Floor and foundations are of concrete. The plank frame is covered with drop siding. A simple, practical, convenient pork-producing plant.





Star Hay Barn No. 26

THIS Hay Barn is not a temporary shed, but a permanent and substantial structure which will add greatly to the value of any farm.

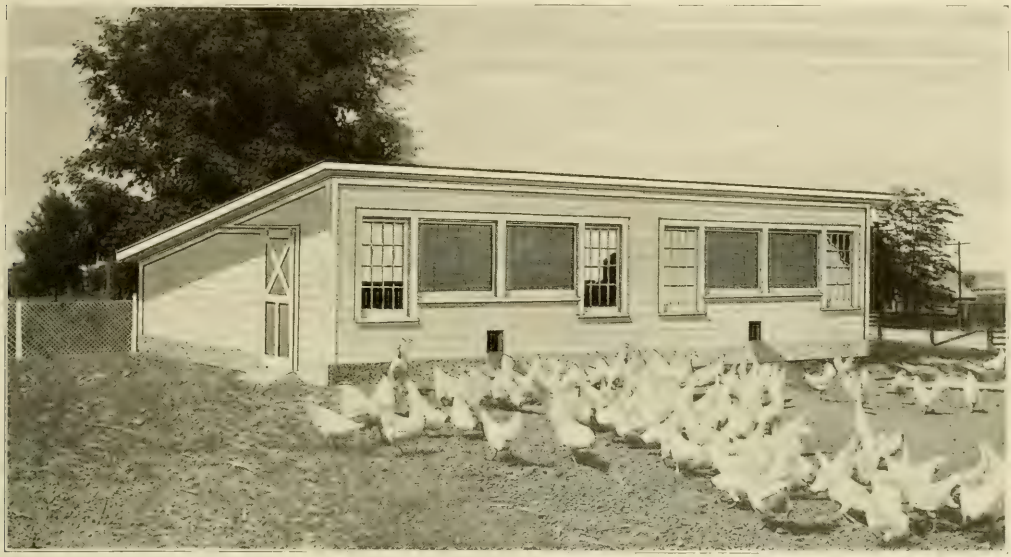
The over-all dimensions of the barn are 30 ft. by 84 ft., and the height from grade to ridge is approximately 36 ft. It has a capacity of 130 tons of hay.

The roof is carried by a well designed truss. The walls are thoroughly braced and trussed. The frame can be covered with vertical drop siding, or barn boards with wood or steel battens. The super-structure of the building is carried on concrete piers. The barn has no concrete floor, but this feature can be added if desired.

The large driveway doors at the side and gable end permit the entrance of a load of hay. The grade doors are conveniently arranged for the baling of hay. Where increased storage of forage crops is desired, this barn will prove a paying investment.

Always Specify Star "Harvester" Hay Tools

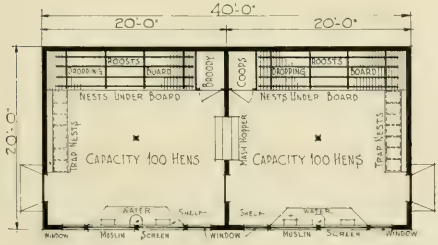
No matter what kind or style of hay or grain storage barn you may build, you can get STAR Hay Tools for it and make it a better and more profitable building. STAR "Harvester" Hay Tools have won the highest endorsement from thousands of American farmers wherever hay or grain is stored. They are built with the strength that insures long, satisfactory service and are designed to give you all the latest labor-saving conveniences that years of study and experience could produce.



Star Farm Poultry House No. 27

A HIGH, well drained, sloping area with a southern exposure is the ideal place to locate the permanent poultry house, if the best results are to be expected from laying hens during any season of the year.

The building should be situated with a view towards saving time and labor in caring for the birds. Direct sunlight should reach every part of the house. Ventilation is so important that it determines, to a large extent, the design of the house. Poultrymen agree that some form of the open front, such as shutters, muslin curtains, or wire netting, supplies the best system of ventilation. To obtain the best results, the house should be so constructed that it can be made perfectly tight except part of the south side, which always should be left open to admit fresh air. It should be rat and vermin proof.



FLOOR - PLAN

The outside dimensions of the hen house shown above, are 20 ft. x 40 ft. The concrete foundation wall is 8 in. wide and 20 in. deep. The shed roof type of construction is used, with 9 ft. studs in the front and 4 ft. 6 in. studs in the rear. The outside walls are covered with drop siding. The muslin curtains and sash are hinged, and can be left up. The dropping board, perches, and nests are arranged on the back wall. The perches can be hooked up when cleaning. A large, dry, mash hopper is built into the middle partition. There is an elevated platform underneath the muslin front providing room for water, grit, and shell hoppers. Each unit of 20 ft. has a capacity of 100 hens, and as many units can be built as desired.



Visitors Always Welcome

WALDORF FARMS

O. F. KINNEY, Treasurer

KINWOOD REALTY CORPORATION, Owners

Breeders of Pure Bred Stock Guernsey Cattle Berkshire Hogs S. C. White Leghorn Poultry

NORTH CHATHAM, COLUMBIA COUNTY, N. Y.
On the Albany Southern R. R. — Waldorf Station

Office: Waldorf Building

Albany, N. Y., Dec. 19, 1918.

Hunt, Helm, Ferris & Co.,
Harvard, Ill.

Gentlemen:

In answer to yours of recent date we are indeed glad to endorse the use of the Star Water Bowl. We have been using them for over eighteen months and would not care to return to the old system of allowing water to run through the manger.

They have not only increased the flow of milk but we believe are very beneficial to the health of the cows, allowing them to have fresh water when needed and not contaminated by any other animal.

Yours truly,

OFK/A

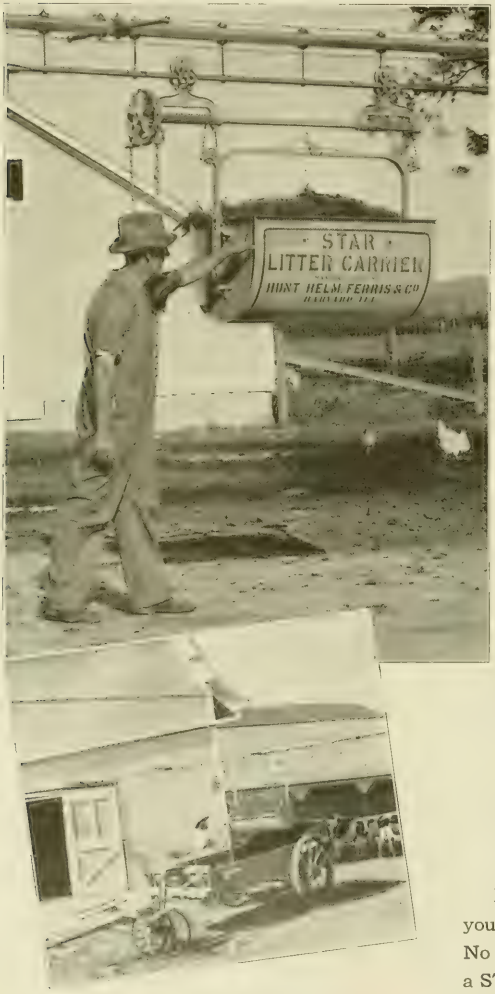
WALDORF FARMS.

O. F. Kinney



STAR Carriers

Special Features About Star Carriers and



ALMOST any litter carrier is a good investment. It's a labor-saving device that is needed in every barn.

But, there's a difference in litter carriers just as there's a difference in other barn equipment.

A litter carrier should give long service. Even tho it saves its cost every few months, there is no reason why a litter carrier should not give many years of good hard service.

STAR Litter Carriers are built to last. They are simple, which means less likelihood of getting out of order. They are extra strong, which means withstanding long, severe service. They are built with every sensible feature for convenience of operation. They are in a variety of types to suit the purchaser's needs. And they are backed with years of experience and the broadest, iron-clad guarantee.

Just remember this one point. We have never heard of any farmer who would take a STAR Carrier out of his barn for the price he paid for it.

Three Kinds of Star Carriers

Regardless of the arrangement of the barn you can get a STAR Carrier adapted to its needs. No barn arrangement is so complicated but that a STAR Carrier can be made to work in it successfully.

To meet every need, three distinct lines of STAR Carriers have been designed, and are fully illustrated and described in this catalog.

Why Farmers Prefer Them

1. Those to operate on STAR Double Angle Steel Track both in the barn and outside, using either swinging booms or stationary track in the yard. (See page 198.)

2. Those to operate on STAR Double Oval Steel Track in the barn and Rod Track in the yard. (See pages 216 and 218.)

3. Those to operate on STAR Rod Track both in the barn and in the yard. (See pages 216 and 224.)

SIMPLE, SERVICEABLE, SECURE—STAR Carriers are simple, practical and durable. Each individual part of the Carrier is built for service and will stand the weight or strain placed upon it in use.

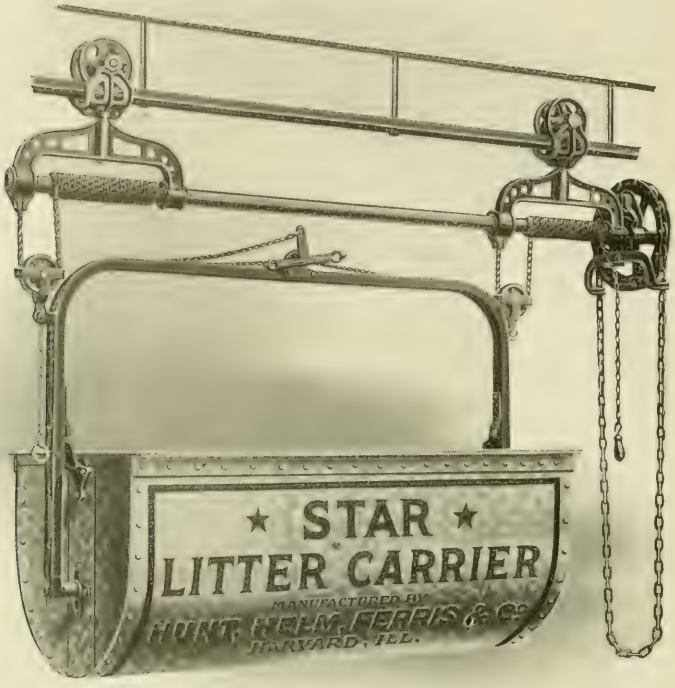
QUICK HOIST—The tub is raised by an endless chain running over the main drive wheel operating the shaft. The lifting power afforded by the drive wheel, and the double purchase effect secured by the chain running under the pulleys at each end of the bail, makes it easy to raise. This device works rapidly, raising the tub in one-third the time ordinarily required.

RAPID LOWERING—The tub may be instantly lowered by pulling the trip chain, which releases the ratchet, allowing it to descend freely to any point desired. You do not have to work to lower the tub; it drops of its own weight, controlled by the friction brake which works on the ratchet.

THE STAR CHANNEL BAIL—The channel bail serves two purposes—it protects the tripping mechanism so that it cannot get out of order, and gives great strength and rigidity to the tub. The carrier tub is held rigidly by latches in the bail, these latches locking both ends of the tub. A chain running in the groove of the bail connects each latch with the double eye tripping lever on top of the bail. The tub can be unlatched only by pressure on this lever. Both latches lock and unlock simultaneously, allowing the tub to dump either way.







Reproduced from Actual Photograph of the

No. 333 Star Litter Carrier

Full Roller Bearing for STAR Double Angle Steel Track

"THINK of getting three carriers in one!" That is exactly what you can get with this outfit. The conveyor of this No. 333 STAR Litter Carrier are interchangeable with the STAR Feed Carrier Body and the STAR milk can carrier rack, as illustrated on pages 200, 201 and 202.

This means an economy of equipment, and much greater convenience in doing barn work. Changing from one carrier to the other means simply unhooking the tub or rack.

This is something new in litter carrier equipments. You will want it in your barn. And once you have it, you will never want to get along without it.

The conveyor operates on STAR Double Angle Steel Track in the barn in connection with either swinging boom outside or stationary track supported by posts.

No. 333 Star Litter Carrier

(Continued)

SPECIFICATIONS

DOUBLE ANGLE STEEL TRACK — described on page 206.

LAG SCREW HANGERS for Double Angle Steel Track—described on page 206.

SWIVEL TRACKER WHEELS — affording a double bearing on the track; diameter 4½ inches. Each Tracker Wheel operates on 12 extra long, cold rolled steel bearings surrounding a shouldered axle pin of special hardened steel.

MALLEABLE SUPPORTING BRACKETS — connected to the trucks by heavy cold rolled swivel heads.

HORIZONTAL SHAFT — on which the wrap chains wind. This shaft revolves in the supporting brackets which afford a four-point suspension, and turns on 76 cold rolled, hardened bearings contained in the supporting brackets.

FOUR-POINT SUSPENSION — The tub is suspended by wrap chains from four points on the shaft which gives not only a double purchase on the load but also eliminates end motion. The wrap chains are made of close link Machine Chain and will wind closely and neatly around the horizontal shaft without kinking or breaking.

HAND CHAIN — The tub is raised by an endless chain operating over the main drive wheel secured to the end of the shaft. When the tub is raised to the shaft it becomes rigid so that there is no swinging motion.

RATCHET AND BRAKE — The tub is lowered by pulling the trip chain which releases the ratchet, allowing the tub to descend freely to any point desired. Additional pressure on the trip chain acts as a brake, giving the operator control of the speed in descending.

CHANNEL BAIL — Holds tub perfectly rigid, protects the tripping mechanism and adds strength to the tub. Fitted with loops for holding hooks and pulleys for interchanging with feed and milk can carriers.

BAIL LATCHES — The tub is held rigidly upright by latches locking both ends. A chain running in the groove of the bail connects both latches with the tripping lever and operates them in unison.

TRIPPING LEVER — The latches hold the tub at each end and are released by pulling on the trip chain attached to the tripping lever.

CHAIN GUIDE — Malleable iron—keeps the hand chain in line with the main drive wheel and prevents it from jumping off.

TUB — Constructed of heavy galvanized steel. Ends are of one piece with flanges formed on the edges, to which the body sheet is riveted and soldered, making it water-tight.

The ends are reinforced with heavy galvanized plates; top edges of the tub are reinforced with galvanized angle irons both along the ends and sides; the corners are securely riveted, as is every joint in the construction of the tub. These tubs are indestructible; will not get out of shape, and are self-cleaning when dumped on account of the rounding bottom which permits of no corners in which litter can collect; the shape of the tub makes it possible to carry a larger load than with square or other shaped tub.

WEIGHTS AND SIZES OF TUBS

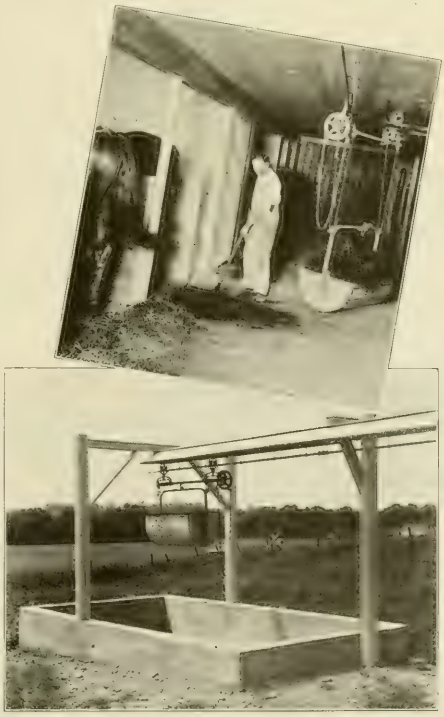
Tubs furnished in four sizes, as follows, outside dimensions:

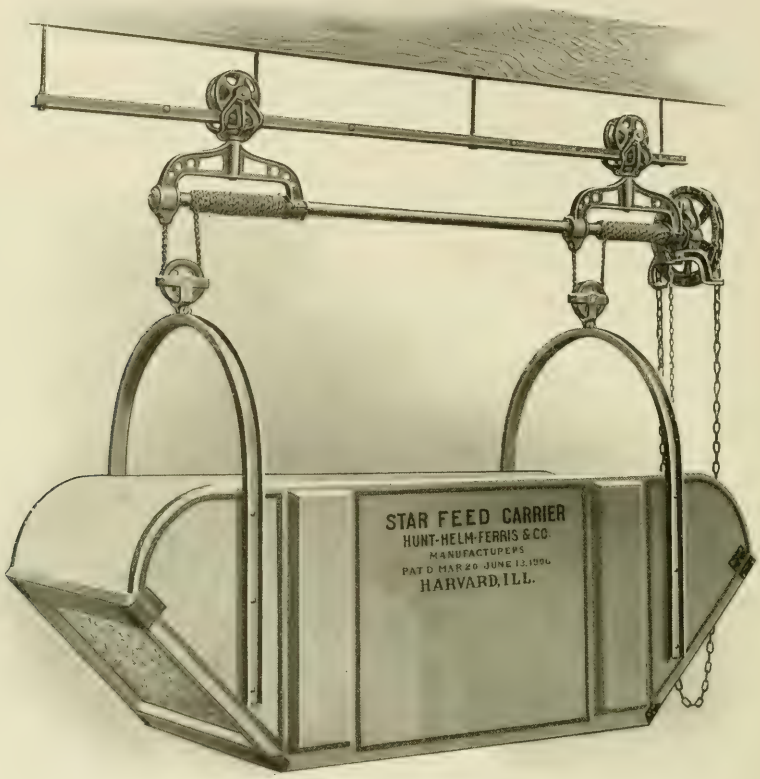
No.	Width	Length	Depth	Weight	Capacity
2	26 in.	41 in.	14 in.	91 lbs.	6 bu.
4	26 in.	41 in.	17 in.	93 lbs.	8 bu.
6	26 in.	41 in.	19 in.	95 lbs.	10 bu.
8	34 in.	41 in.	24 in.	130 lbs.	12 bu.

SWINGING BOOMS — described and illustrated on pages 204 and 205.

SWITCHES, CURVES AND OTHER ACCESSORIES are found on pages 206 to 211, inclusive.

No. 333 STAR Litter Carrier, weight, not including tub, 50 pounds, finished in gray enamel.





Reproduced from Actual Photograph of the

No. 334 Star Feed Carrier

Full Roller Bearing, for Use on STAR Double Angle Steel Track

A NECESSITY—Time has proven that a Feed Carrier is a necessity in any dairy or stock barn where more than six head of cattle are kept. STAR Feed Carriers and STAR Feed Trucks have, for a number of years, been a proven success in thousands of dairy barns.

SAVES STEPS—Feeding silage and ground grain is a long, tedious chore if the old-fashioned, back-breaking basket method is used. A careful estimate in a 40-cow stable shows that you will walk from 50 to 70 miles farther in six months' time feeding silage twice a day with a basket than while using a STAR Feed Car or Feed Truck.

Saving steps is saving labor, and saving labor is saving money and helps solve the hired help problem on the farm!

OVERHEAD TRACK—A Feed Carrier operating on a track suspended from the ceiling is not hindered by different floor levels or by obstructions in the feed alley. It is especially convenient where Feed is to be carried any distance as the outside track can be extended so that the feed is easily delivered to feeding racks or troughs.

AN INVESTMENT—A STAR Feed Carrier will pay for itself in six months' time by actual time saving. From that time on it represents an investment that pays dividends every day in the year. It not only saves time and labor but it makes possible the systematic feeding of a balanced ration, so necessary in the production of a maximum yield of milk.

The Feed Tub is easily raised and lowered by its own weight. It can be held at any desired height while feeding. Any boy large enough to do feeding can operate a STAR Feed Carrier easily and successfully.

Tub is instantly detachable as shown below in Fig. 843, and may be replaced with litter tub shown in Fig. 333 on page 198.

SPECIFICATIONS

OPERATION — The Hoist and Trucks of the No. 334 STAR Feed Carrier are identically the same as those used on the No. 333 STAR Litter Carrier of which detailed description and specifications are given on page 198.

CHANNEL STEEL BAILS — of 1½ x ⅞-inch channel steel. The high bails are made oval so as not to interfere in any way with the filling of the tub or the feeding. They are securely bolted to the tub and extend almost to the bottom, reinforcing the sides. Fitted with loops for holding hooks and pulleys to interchange with litter and milk can carriers.

GALVANIZED ENDS AND BOTTOM — give a smooth surface from which to shovel. This heavy galvanized steel is securely bound and reinforced at sides and bottom.

FEED TUB — Sides are of best selected wood, well seasoned and kiln-dried, clear and free from knots. The shape permits shoveling from either end and is therefore practicable to be used by two men, one working from either end Size of tub—68 inches long, 26 inches wide, 24 inches deep. Capacity—Approximately 16 bushels.

FINISH—All Steel and malleable iron parts finished in gray enamel, baked on. Woodwork after being carefully sandpapered, is given a lead and oil coat, after which it is finished with a final waterproof coat of special varnish-enamel.

Weight of Carrier complete with tub, 125 pounds.

INSPECTION — All STAR Feed Carriers and Feed Trucks are subjected to five inspections before they finally leave the shipping room.

SWITCHES, CURVES, TRACK and other accessories are described and illustrated on pages 206 to 211, inclusive.

The No. 334 STAR Feed Carrier illustrated opposite is shown in connection with STAR Double Angle Steel Track. It is also furnished for use on STAR Double Oval Steel Track when so specified.

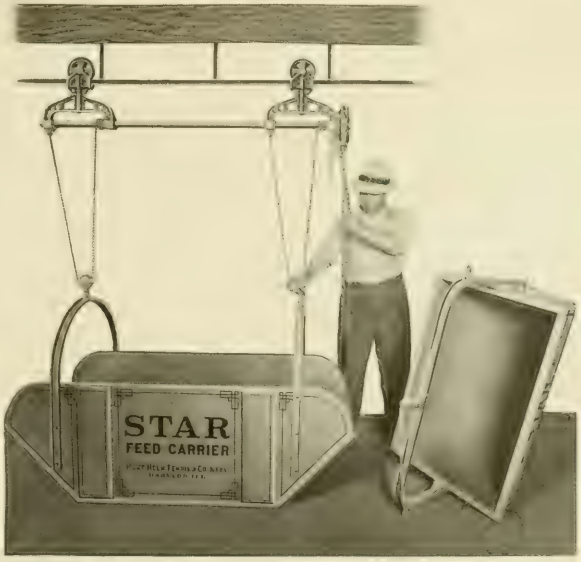
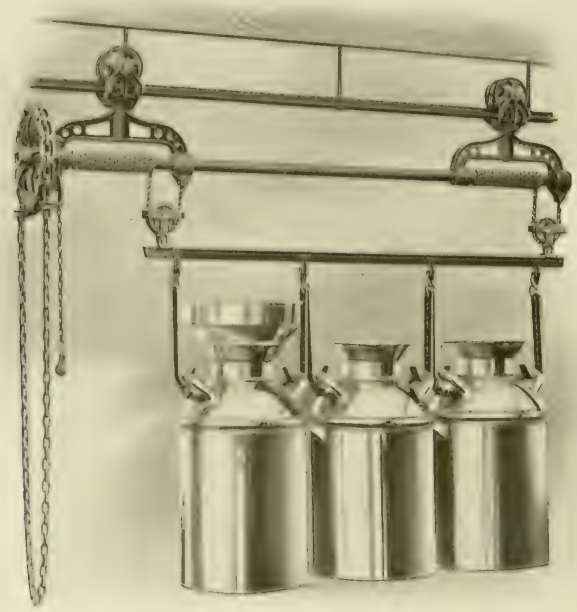


Fig. 843 Feed Tub being removed to permit use of Litter Carrier Tub



Reproduced from Actual Photograph of the

No. 413 Star Milk Can Carrier

Full Roller Bearing, for use on Star Double Angle Steel Track

THIS illustration shows our new and improved raising and lowering STAR Milk Can Carrier. Many attempts have been made to construct a Milk Can Carrier that would perform the maximum amount of work with the minimum amount of labor. We believe, therefore, that the STAR MILK CAN CARRIER will at once commend itself to every dairyman.



OPERATION: This carrier operates exactly like the No. 333 STAR Litter Carrier described and illustrated on pages 198 and 199; has the same conveyor and raising and lowering device. To this conveyor may be hooked the

No. 413 Star Milk Can Carrier

(Continued)

litter tub shown in Fig. 333 on page 198, or the feed tub shown in Fig. 334 on page 200. Instead of suspending a tub from the winding chains, the sheaves through which the winding chains operate are hooked to both ends of a steel bar.

Steel straps are suspended from the main bar with hook ends which engage the milk can handles. These steel straps are spaced the proper distance apart to admit the use of a strainer without having to detach the cans from the time they are taken empty from the milk house to the time they are returned filled. As the cans can be lowered to within an inch of the floor, it is unnecessary to bring them into contact with the barn floor, assuring a perfectly sanitary condition.

When the carrier is run into the milk house, the cans may be lowered into the cooling tank by merely pulling down on the trip chain, releasing the ratchet on the drive wheel. The speed in descending can be regulated by the hand chain.

This carrier is a distinct improvement over the platform type with which it is not only necessary to lift the cans on and off the platform, but there is always a chance of their slipping off when going around a curve.

Those who daily have to lift and carry the filled cans from the barn to the milk house, put them into the cooling tank and then lift them out again, will appreciate at a glance the saving in time and doing away with a lot of hard work made possible by the installation of a STAR Milk Can Carrier.

SPECIFICATIONS

MAIN BAR—51 inches long of $1\frac{1}{4} \times 1\frac{1}{4}$ inch T-rail steel to which the malleable sheave frames are hooked and from which the three pairs of steel can hooks are suspended.

CAN HOOKS—engaging the handles of milk cans, of $\frac{3}{16} \times 1\frac{1}{2}$-inch steel, securely attached to the main bar.

SWITCHES, CURVES, TRACK and other accessories are found on pages 206 to 211, inclusive.

FINISH—Gray enamel, baked on.

No. 413 STAR Milk Can Carrier, 3 cans, weight complete, 70 lbs.

If single can carrier is desired, specify No. 419.

Either the three can or single can carriers are furnished for use with either STAR Double Angle Steel Track, STAR Double Oval Steel Track, or Rod Track, when so specified.





Reproduced from Photographs of Star Swinging Booms in Actual Use

The Star Swinging Boom

THE STAR Swinging Boom represents the most satisfactory method of supporting track outside of the barn. It leaves the yard entirely clear, there being no supporting posts to interfere with the use of the yard or to cause injuries to cattle or horses; no lumber to rot out or break.

The STAR Swinging Boom makes possible a dumping area eight or ten times greater than with a post supported track.

When not in use, the boom may be swung around against the barn. This feature is especially desirable where the hay is taken in at the end of the barn, as the boom is not in the way.

The track inside of the barn and that suspended from the boom is connected by the Sliding Removable Section shown in Figure 438.

The length of the boom depends upon the height of the barn. The distance from boom to the clevis, from which the guy rods are suspended, should be at least 3 to 5 feet greater than one-third of the total length.

If a 30-foot boom is desired, the guy rods should be attached 13 to 15 feet or more above the boom itself.

The boom is attached to the barn by means of our patented hinge shown in Fig. 438, which straddles the door rail. Pivoted in this hinge is the boom itself of suitable length and supported by guy rods secured to the barn by clevis and plate directly above boom hinge.

SPECIFICATIONS

MALLEABLE BOOM HINGE — straddles door rail, a ⅞ x 5½-inch pin forms the pivot and connects the part of the hinge secured to the boom with the part attached to the barn.

BOOM — constructed of heavy 2 x 2-inch galvanized high carbon steel angles, from which track is suspended by malleable clamps and track hangers. This construction is much stronger and more lasting than booms of ordinary gas pipe.

BOOM HANGERS — of suitable length to suspend the track approximately 6 inches below the boom. If for any reason it is necessary to place the boom hinge above the door rail, longer hangers are necessary. When ordering longer boom hangers, specify the number of inches "longer than regular."

SLIDING REMOVABLE SECTION — This patented feature is one of the strongest arguments in favor of a STAR Boom. It is built of malleable iron. This section telescopes as the boom turns around in a half circle. It allows the carrier to leave the barn even when the boom is standing at an angle, without friction or binding.

The Sliding section may be removed from the pivots at one end or at both when the sliding doors are to be closed. If double sliding doors are used, these doors may be notched to fit closely around the sliding removable section so that it is never necessary to remove it.

STAR DOUBLE ANGLE STEEL TRACK — See page 206.

LENGTHS — Booms are furnished regularly in the following lengths: 15 ft., 20 ft., 30 ft., 35 ft., and 40 ft.

Furnished complete with track hangers, guy rods, truss rods, side arms, etc. The side arms and truss rods are not necessary with the 15-ft. and 20-ft. lengths.

When ordering, specify distance from the point where hinge of boom will rest, to the point where the guy rods fasten to the barn.

STAR Swinging Boom, complete, including Sliding Removable Section, hinge, track, hangers and all accessories, average weight, 7½ pounds per foot.

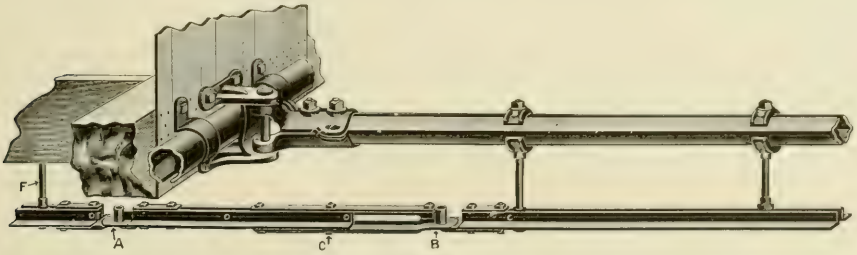


Fig. 438

Star Double Angle Steel Track

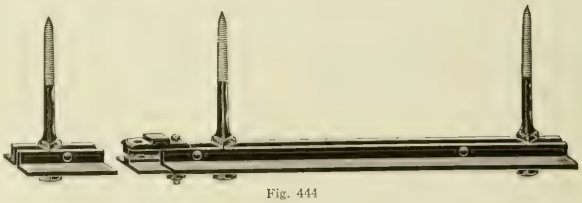


Fig. 444

SPECIFICATIONS

STAR DOUBLE ANGLE STEEL TRACK, as the name suggests, is built of two pieces of ⅞-inch high carbon steel angles, separated by malleable spools and securely riveted. This construction will test out stronger than anything used for a similar purpose—with hangers spaced 12 inches apart it has been used successfully to carry loads averaging 1,000 pounds to the foot. The two angles not only afford a double tread for the tracker wheels but are joined so rigidly that the track lines up perfectly and remains so. Compare this perfect alignment of any installation where Double Angle Steel Track is used with the "snake's crawl" appearance of ordinary one-piece tracks. Figure the saving in installation—the saving in keeping aligned and lastly the appearance and then decide the track to use in your barn. Star Double Angle Steel Track is finished in japan—weight per foot, 2 pounds. Furnished in 6 and 12-ft. lengths.



Fig. 414.—Lag Screw Hanger

STOP BLOCK FOR END OF TRACK, Fig. 363 (not illustrated), weight each, ¼ lb.

LAG SCREW HANGER—accomplishes two things well—makes the track perfectly rigid, doing away with swinging motion and keeps it level always, no matter how uneven the joists. The diameter of this hanger is 7-16 inch. It is threaded 3½ inches.

Note the square shoulder just above the track on which a wrench can be used at any time to keep the track level

A track can carry no more than the hanger supporting it. With the lag screw hanger, the weight is always directly below. The advantage of this method of suspending track over that of using track hangers fitted into the side of the track will be apparent if you will raise any given weight with the arm straight down and then attempt to raise the same weight while holding the arm at a right angle.

When installing, use a chalk line to line up the hangers—screw them into the joists, remove the burrs and washers, then attach the track—you don't have to bother with the track until the hangers are in place.

SIZES—The 10¼-inch lag screw hangers allow the track to hang approximately 6 inches below joists or wood supports in the yard. Specify this size where wood timbers are used to support track outside or where there are no beams to clear inside of the barn. These hangers are usually spaced 24 inches apart but construction of track permits spacing them to suit the arrangement of joists. When determining the number of hangers, allow four for each curve.

The stock sizes of Lag Screw Hangers follow. Where longer hangers are needed on account of extra high ceilings, simply specify the distance from joists to track and the proper length will be supplied.

Fig. 414, 10¼-in. Lag Screw Hangers, weight per doz., 5 lbs.

Fig. 414, 15¼-in. Lag Screw Hangers, weight per doz., 7½ lbs. clears 6 in. beams.

Fig. 414, 17¼-in. Lag Screw Hangers, weight per doz., 9 lbs., clears 8-in. beams.

Fig. 414, 19¼-in. Lag Screw Hangers, weight per doz., 10 lbs., clears 10-in. beams.

Fig. 414, 21¼-in. Lag Screw Hangers, weight per doz., 11 lbs., clears 12-in. beams.

MALLEABLE TRACK SPLICE—included in each shipment without extra charge. Joins and holds sections of track rigidly so an even strength is maintained

Accessories for Double Angle Steel Track

Where Lag Screw Hangers are not used, then Fig. 339 Eye Hangers should be specified. They can be used with either Joist Brackets, Fig. 126, or Ridge Pole Hangers, Fig. 87, or in connection with double eye hangers, Fig. 377, and Screw Eyes, Fig. 376, where the track must hang a greater distance below joists than usual.

Ordinarily figure one Fig. 339 Hanger with either Joist Bracket or Ridge Pole Hanger for every two feet of track and four of each for each curve. Construction of track and curves permits hangers to be spaced to suit joists—the 6¾-in. length should be specified for use with wood supports in yard or where there are no beams to clear in the barn.

The stock sizes of Fig. 339 Hangers are shown below:

Fig. 339, Eye Hangers, 6¾-in., weight per doz., 5 lbs.

Fig. 339, Eye Hangers, 11¾-in., weight per doz., 7 lbs., clears 6-in. beams.

Fig. 339, Eye Hangers, 13¾-in., weight per doz., 9 lbs., clears 8-in beams.

Fig. 339, Eye Hangers, 15¾-in., weight per doz., 10 lbs., clears 10-in. beams.

Fig. 126, Joist Brackets for use with Fig. 339 Hangers, weight per dozen, 3½ lbs.

Fig. 87, Ridge Pole Hangers for use with Fig. 339 Hangers, weight per doz., 5½ lbs.



Fig. 87.—Ridge Pole Hanger



Fig. 126.—Joist Bracket



Fig. 339. Hook Hanger



Fig. 376. Screw-eye

Fig. 376, Screw Eyes for use with Fig. 339 Hangers, weight per doz., 4½ lbs.

Fig. 377, Double Eye Hangers for use with Fig. 339 Hangers, 15 in., weight per doz., 10 lbs.

Fig. 377, Double Eye Hangers for use with Fig. 339 Hangers, 20 in., weight per doz., 12 lbs.

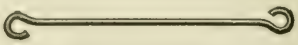


Fig. 377.—Double Eye Hanger

Star Two-way and Three-way Switches

For Use in Connection with Star Double Angle Steel Track

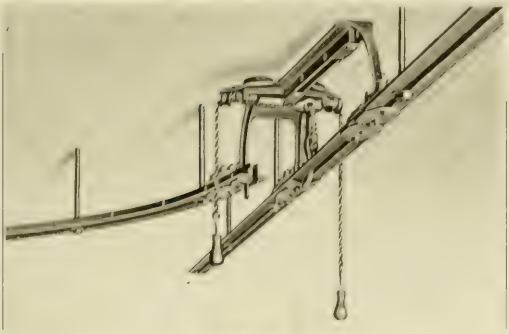


Fig. 317

CONSTRUCTION

THE STAR Overhead Switches, illustrated on this page, have been perfected to a point far in advance of anything similar offered, regardless of price.

We can offer you no better argument for installing a STAR Overhead system of track for any purpose than the perfected switches which we have been furnishing a number of years. These switches are an assurance against all switch annoyances they are simple, strong and efficient nothing to get out of order, nothing to break, and what's more, the carrier cannot run off when the switch is open. The automatic safety locks take care of that.

OPERATION A simple downward pull on either hand chain will cause the hinged section to travel either to right or left, register and lock automatically in perfect alignment, and just the instant that the hinged section is released from its position the safety lock drops down and guards the open end of either straight track or curve no watchman could be as faithful or efficient.

Specify Two-way Switch when branching off either to right or left of main track. Allow 29 inches between the two ends of the main track, then bolt the switch in place.

Specify Three-way Switch when branching off to both right and left of main track. Allow 29 inches between the two ends of the main track, then bolt switch in place.

Two-way Switch, weight each, 26 pounds.

Three-way Switch, weight each, 29 pounds.

Finish- Black Japan.

When ordering curves for use with Switches, specify whether for Two-way or Three-way Switches. Curves illustrated and described on page 208.

STAR Switches are constructed entirely of the best malleable iron, except the hinged section and the backbone, which are of the same strong construction as STAR Double Angle Steel Track itself. They are rigidly attached to the track and curve ends by malleable splices. The backbone and malleable legs on the frame are joined as rigidly as though they were cast in one piece, yet this backbone is adjustable in order that the switch itself can be lined up with the track and curves which it connects.

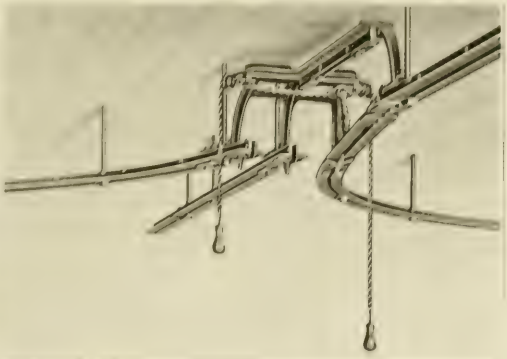


Fig. 319

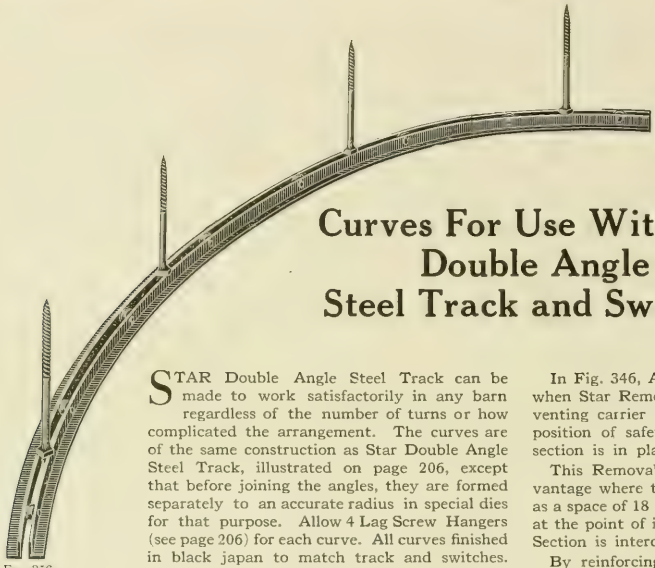


Fig. 356

Curves For Use With Star Double Angle Steel Track and Switches

STAR Double Angle Steel Track can be made to work satisfactorily in any barn regardless of the number of turns or how complicated the arrangement. The curves are of the same construction as Star Double Angle Steel Track, illustrated on page 206, except that before joining the angles, they are formed separately to an accurate radius in special dies for that purpose. Allow 4 Lag Screw Hangers (see page 206) for each curve. All curves finished in black japan to match track and switches.

Removable Section of Track

The illustration below shows the Star Removable Section to be taken out when the door is closed. This short section is fitted with malleable ends which release the safety locks when the section is in place. The safety locks are most important as they automatically drop down to prevent the carrier from running off the open ends of track when the removable section is taken out.

In Fig. 346, A shows position of safety lock, when Star Removable section is removed, preventing carrier from leaving track. B shows position of safety lock when Star Removable section is in place, permitting carrier to pass.

This Removable Section is also used to advantage where two tracks cross at right angles as a space of 18 inches can be left in both tracks at the point of intersection and the Removable Section is interchangeable with either track.

By reinforcing the Star Removable Section and making it longer, it can be taken out when swinging doors are closed. When specifying reinforced removable sections for swinging doors, state the length wanted. This length should be at least six inches more than the width of the door to allow plenty of clearance.

Star Removable Sections for Sliding Doors or Cross Overs where tracks intersect, regular length 18 inches, weight, 6 lbs.

Star Reinforced Removable Sections for Swinging Doors, any length up to 5 feet 6 inches, approximate weight, 7½ lbs. per foot.

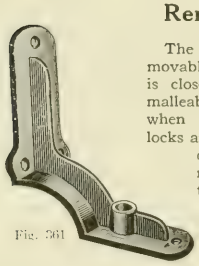


Fig. 361

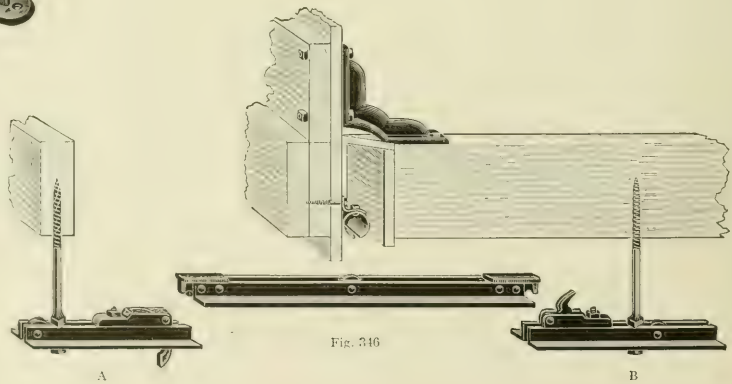
Wall Bracket For Wood Ridge Pole

Fig. 361

Where Wood Ridge Pole is used outside of the barn to support the track, this can be attached to the barn by wall bracket, Fig. 361.

This wall bracket of malleable iron is made to give the necessary support to the end of the Wood Ridge Pole and to provide clearance for the door rail and sliding doors.

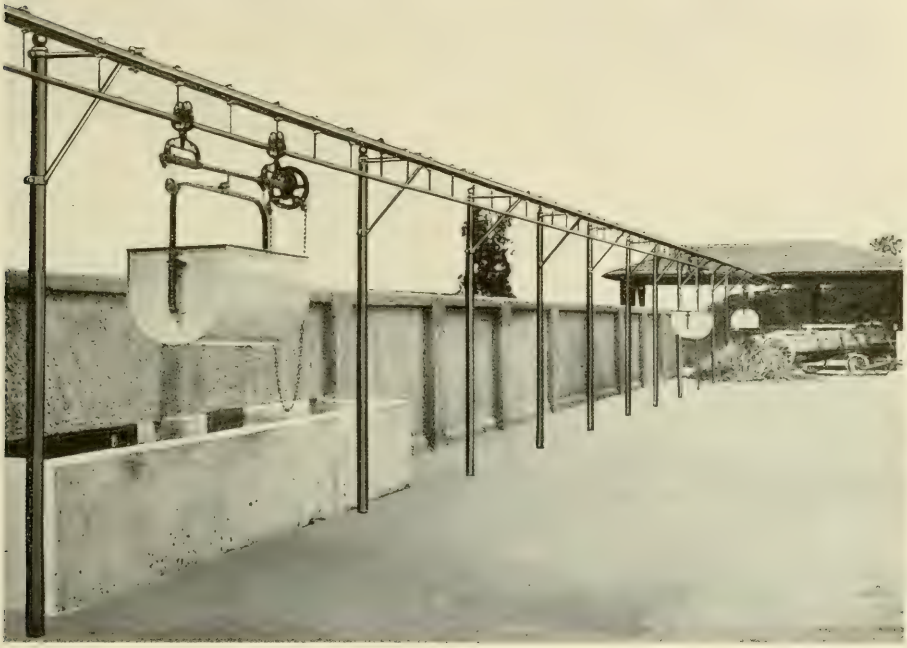
Wall Bracket, Fig. 361, for Wood Ridge Pole, weight, 6 lbs.



A

Fig. 346

B



Support for Star Double Angle Steel Track Outside of Barn

THE above illustration shows our unique **All-steel** support for STAR Double Angle Steel Track in the yard where a swinging boom or wood ridge pole is not desired.

This steel support is similar to the STAR Swinging boom construction, illustrated on pages 204 and 205. It is made of two 2-inch high carbon galvanized steel angles rigidly joined by hanger supporting clamps. This construction is very strong and durable as well as neat in appearance.

STAR Steel Columns, as described and shown on the following page, are used to support this steel construction. These columns should be placed ten or twelve feet apart and securely set in concrete.

STAR Steel Support for Double Angle Steel Track complete, including track, hangers and attachments—everything except supporting columns, average weight per foot, 6 pounds.

Star Steel Columns and Brackets

For Supporting STAR Double Angle Steel Track

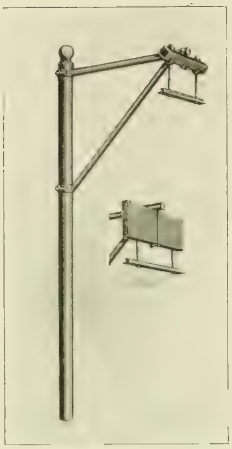


Fig. 781

IN FIGURE 781 we illustrate a Steel Column 4 inches in diameter, with triangular bracket from which the Steel Support illustrated and described on the preceding page or Wood Ridge Pole, Fig. 782, can be neatly and permanently suspended.

In figuring the height of the columns, allow at least two feet for an anchorage below ground level. Each column should be firmly set in concrete abutment.

The triangular bracket allows for the proper clearance of the carrier. This bracket is made of 1¼-inch O. D. pipe and attached to the upright column by malleable clamps.

Steel Columns—Diameter, 4 inches; height to order; weight, per foot, 5 pounds.

Ornamental Ball for Steel Column, weight, each, 6 pounds.

Triangular bracket, complete as illustrated, weight, each, 20 pounds.

When ordering, specify whether for Steel Support or Wood Ridge Pole.

Finish: Gray enamel.

Fig. 783 shows a special horizontal bracket for carrying the Steel Support illustrated on the previous page when installed along side of barn. This does away with posts or other obstructions and leaves the space along side of barn entirely clear. A malleable split flange is used to attach bracket to the side of barn.

Horizontal Bracket for Steel support complete as illustrated, weight each, 12 pounds.

Finish: Gray enamel.

Fig. 784 illustrates a simple and economical method of suspending the Wood Ridge Pole supporting Double Angle Steel Track along side of barn. The track should be attached to 2 x 8 or 2 x 10 timbers which can be held away from the barn a distance of 4 feet 6 inches by wood pieces spaced 6 to 8 feet apart. Strap irons attached by Lag Screws support the entire wood construction. This illustration offers a practical solution of the problem of installing Double Angle Steel Track suspended from Wood Ridge Pole along side of barn.

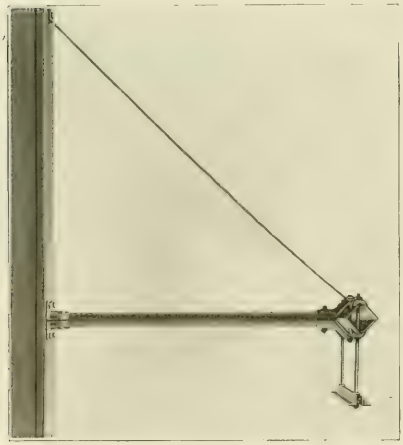


Fig. 783

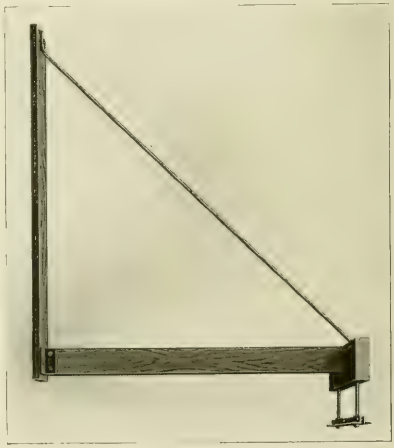


Fig. 784

How to Order Carriers and Accessories for Star Double Angle Steel Track

CARRIER—Select the carrier and if for Litter, specify the size of tub—either No. 2, 4, 6 or 8.

TRACK—Take inside measurements first as though the track were to be installed with square turns. Add the number of feet required for out in the yard and then deduct 8 feet of track for each curve used without switch and 4 feet of track for each curve for use with switch. (If a Swinging Boom is desired, do not figure any track, hangers or accessories for use outside of barn, as everything necessary will be furnished with the boom.) Track is shipped in 6 and 12-foot sections.

HANGERS — Fig. 414 Lag Screw Hangers are universally used. Figure one for every joist if 2 feet apart, one for every other joist if spaced 16 inches apart. Always figure 10¼-inch hangers for track suspended from Wood Ridge Pole in the yard and for inside of barn if there are no beams to clear. If carrier passes under the beams on which the joists rest, then measure the size of the beams and by referring to page 206 you can determine the length of hangers needed for use inside of the barn. Track should be installed level where possible.

To determine length of hangers for different heights of ceiling, first determine length of hangers needed for suspending track under the lowest ceiling, and the hangers required for the higher ceiling will be as much longer as one ceiling is higher than the other.

SWINGING BOOM — If Swinging Boom is desired, specify length, 15, 20, 30, 35 or 40 feet, and the distance above hinge that the guy rods will be attached to the barn. The boom includes everything necessary for use outside of barn, also the sliding removable section (see page 205). If the boom hinge instead of straddling the door rail, which would be impossible with a single sliding door, is to be attached to the barn above the door rail, then specify length boom hangers that will be required. Simply specify how many inches longer than regular these boom hangers are to be. Regular length boom hangers allow the track to hang 6 inches below the boom.

Swinging booms are also used frequently to suspend track over driveway, so that when swung out of the way, the driveway is clear. When ordering booms for driveways, specify the exact length and also specify one cast iron boom bracket to support the end of the boom opposite from the hinge to hold it in place.

REMOVABLE SECTION — Specify one Removable Section for each sliding door through which track passes (see page 208), except when swinging boom is ordered, in which case the sliding removable section is furnished in connection with the boom. Also specify removable section for each place where two tracks intersect at right angles.

REINFORCED REMOVABLE SECTION — Specify one Reinforced Removable section for each swinging door out of which track extends, being sure to state length. Length should be at least 6 inches longer than width of door.

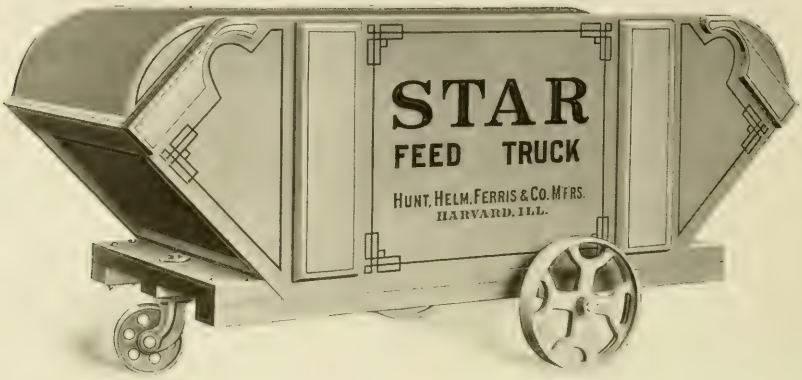
SWITCHES — Specify two-way switch for each place where track branches off to either right or left of the main line. Specify three-way switch for use where track branches off to both right and left of main line.

CURVES — Specify one regular 90-degree curve for each right angle turn where switch is not to be used. Specify one curve for use with two-way switch for each two-way switch used. Specify two curves for use with three-way switch for each three-way switch used.

END STOP — Fig. 363. Specify one for each end of track to keep car from running off the track.

WALL BRACKET — Specify one to use in connecting Wood Ridge Pole to barn (see page 208).

DETACHABLE SECTION — If a section of wood support in the yard or across driveway is made removable to allow passageway for teams, specify a Detachable Section of track the same length as the wood ridge pole made removable. This detachable section is attached to and can be taken out with the section of wood ridge pole.



Reproduced from Actual Photograph of the

No. 443 Star Feed Truck

THE STAR Floor Feeding Truck is a necessity in every barn where an overhead feed carrier is not used. It is lower in cost than a suspended carrier since track hangers and switches are not required. It can be operated to any place in the barn, run directly under the feed or silo chutes—can be used not only for carrying feed, but also bedding, baled shavings or any other material to be delivered to any part of the barn. It is easily operated over a concrete or wood floor and can be turned in its own length. Read the description on opposite page.

Easy Running Short Turning

Here is a feed truck that is very easy to handle. It is built low down, easy to fill and feed from, and rides on wheels properly spaced to balance the load.



STAR Equipped Barn, Owned by Myron Stratton Home Farm, Colorado Springs, Col.

It is built, reinforced and finished so that it will not warp, crack or go to pieces under the hardest usage. No point for strength and durability has been overlooked. The heavy hardwood frame bolted together, extends the full length of the bottom, with an extra full length center-piece reinforcing the steel bottom of the tub.

The hardwood frame to which the trucks are secured is built entirely separate from the tub and is in no way dependent upon the tub for support.

This is a truck that will last for many years of hard service. The care exercised in its construction is the reason why you will find it in use in thousands of the finest barns in this country.

No expense has been spared to build a truck that is stronger, more lasting and neater in appearance than any similar truck offered.

SPECIFICATIONS

TUB bottom of one piece, heavy galvanized steel securely fastened to the sides of selected wood, well seasoned, kiln-dried, clear and free from knots, sap and check. Reinforced at sides, bottom and ends with galvanized steel corner plates. Truck is fitted with hand-holds at ends.

FRAME upon which tub rests of best selected 2 x 4 inch hard maple, kiln-dried, three pieces extending lengthwise of truck with bolted cross pieces at ends. Frame built entirely separate from tub, and not dependent upon tub for strength.

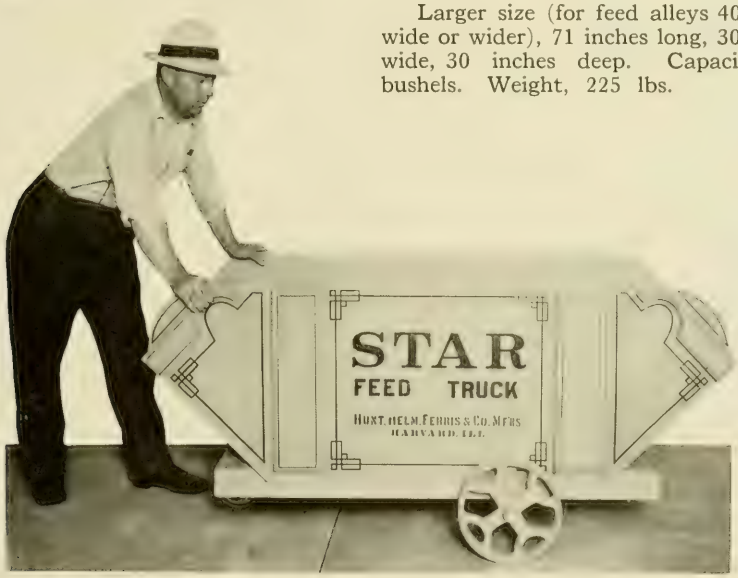
MAIN WHEELS Gray iron, 12 inches in diameter; 2 inch face; machined bearings turning on cold rolled axle, 1 inch in diameter.

FRONT SWIVEL WHEEL Gray iron, 6 inches in diameter; 1½ inch face, with cold rolled steel shaft; swiveled to permit truck to be turned in its own length. All wheels spaced for easy moving of heavy loads.

FINISH Wheels and iron work gray enamel, baked on. Wood work given prime coat of lead and oil after which it is given a final brush coat of special varnish-enamel. Color, gray.

SIZES AND WEIGHTS Regular size (for feed alleys, 36 inches wide or wider) 68 inches long, 26 inches wide, 24 inches deep. Capacity, 16 bushels. Weight, 190 lbs.

Larger size (for feed alleys 40 inches wide or wider), 71 inches long, 30 inches wide, 30 inches deep. Capacity, 25 bushels. Weight, 225 lbs.



No. 836 STAR "All Purpose" Barn Truck

(Patent Applied for)



Fig. 836

HERE is a Barn Truck that can be used for carrying bulk feed, ensilage, cans of milk, barrels of water or swill, bagged grain and for other trucking purposes common in doing the regular chores around the barn. It is an "ALL-PURPOSE" Barn Truck for practically the same price as an ordinary Feed Truck.

Fig. 836 shows the truck with feed box in position complete with tongue. Where bulk feed is being carried, it is generally more handy to push the truck rather than pull it. The tongue is equipped with a special constructed hinge, so that it can be detached or attached to the truck almost instantly without removing a bolt simply raise up the front end and remove or replace the tongue as desired. When tongue is in position it is as secure as if bolted. The Castor Wheel is so constructed that it will swing under truck, which makes it possible to turn the truck in its own length.

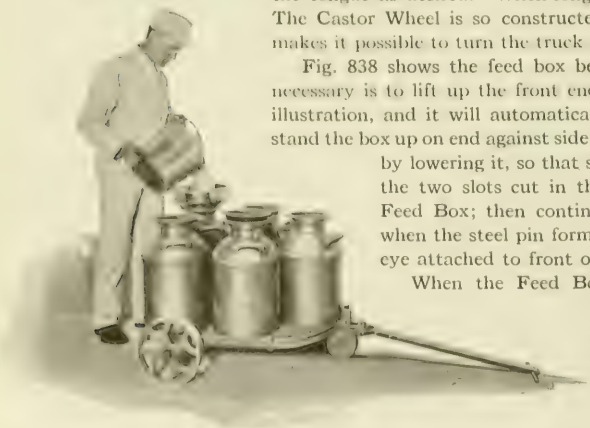


Fig. 837

Fig. 838 shows the feed box being removed by one man. All that is necessary is to lift up the front end of box to about the position shown in illustration, and it will automatically release from the truck proper. Then stand the box up on end against side of barn or partition; the box is replaced by lowering it, so that steel projections on the truck bed fit into the two slots cut in the steel plate attached to bottom of the Feed Box; then continue to lower it until in regular position when the steel pin forming part of castor wheel will fit into steel eye attached to front of box, holding it securely.

When the Feed Box of the STAR "All-Purpose" Truck is removed it can be used for any number of purposes such as carrying milk cans, barrels, bags of grain, etc. Fig. 837 shows the truck loaded with five 8-gallon cans of milk.

It can also be used as a hand truck, as shown in Fig. 839 by removing the castor wheel and tongue. This can be done instantly be releasing the spring pin which permits the wheel, etc., to slip out of position when front of truck is raised. The castor wheel can be replaced by just the opposite operation.

SPECIFICATIONS

BOX—Bottom of one piece, heavy galvanized steel, securely fastened to the sides of selected wood, well seasoned, kiln-dried, clear and free from knots, sap and check. Reinforced at sides, bottom and ends with galvanized steel corner plates. Box is fitted with hand-holds at ends.

FRAME OR BED—Frame or bed upon which box rests of 1½ in. x ⅞ in. steel channel to which floor, made of 2 in. x ⅞ in. lumber, spaced ⅝ in. apart, is securely attached.



Fig. 838

TONGUE—Of hard, kiln-dried, maple, 36 in. x 1¾ in. x 1¾ in., equipped with special hinge for instantly detaching or attaching tongue to swivel truck.

MAIN WHEELS—Gray iron, 12 inches, in diameter; 2 in. face, machined bearings turning on cold rolled steel axle, 1 in. in diameter.

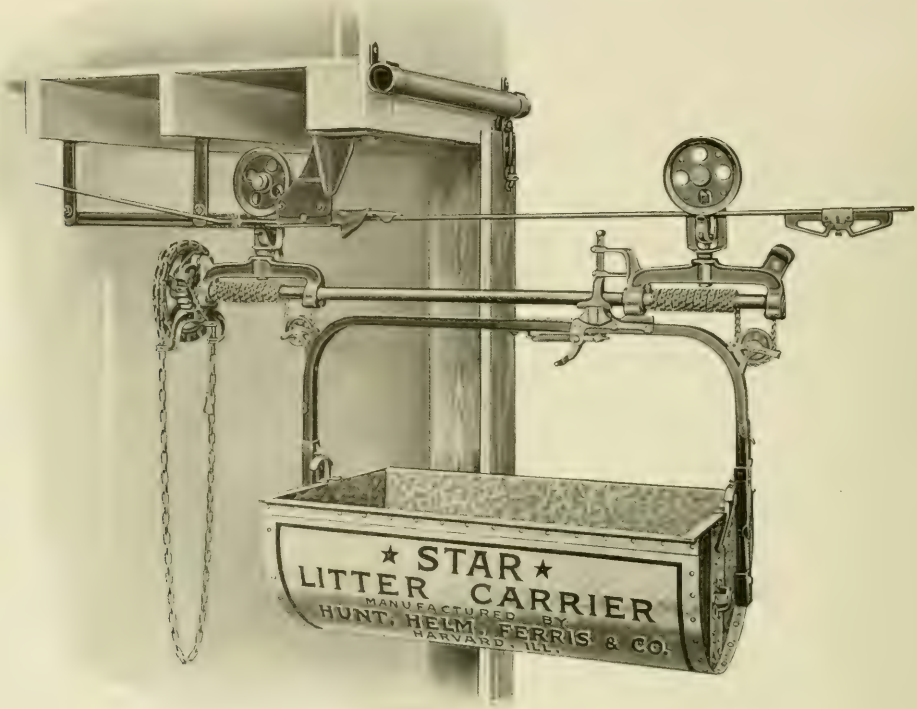
FRONT SWIVEL WHEEL—Gray iron, 6 in. in diameter; 1½ in. face, swivel fork and all other fittings of best grade malleable iron; equipped with automatic spring pin permitting wheel to be removed or replaced; easily released and positive hold; swiveled to permit truck to be turned in its own length. All wheels spaced for easy moving of heavy loads.

FINISH—Wheels and iron work, gray enamel, baked on. Wood work given prime coat of lead and oil after which it is given a final brush coat of special varnish-enamel. Color, gray.

SIZES AND WEIGHTS—Box 68 in. long, 26 in. wide, 24 in. deep. Capacity, 16 bushels. Frame and bed, 36 in. x 28 in. Distance from outside to outside of main wheels, 34¾ in. Weight, complete with box and tongue, 160 lbs. Weight, less box, 90 lbs.



Fig. 839



Reproduced from Actual Photograph of

No. 592 Star Litter Carrier

Full Roller Bearing

A Combination for STAR Double Oval Steel Track Inside and Rod Track Outside

Can also be used on Rod Track both inside and outside

RECOMMENDED where the returning feature afforded by the Rod Track and the inside adaptability of the Steel Track is desired. The Double Oval Steel Track in the barn is always level so that there is no tendency for the carrier to move while being loaded. The carrier is given a push at the barn door and returns automatically. This carrier can be successfully installed in any barn no matter how complicated the arrangement, and regardless of the curves and switches required. The popularity of this type of Litter Carrier is accounted for by the fact that it combines so many desirable features of the steel track equipment with those of the rod track outfits.

The important connection between the STAR Double Oval Steel Track inside the barn and the Rod Track outside is made with the patented Giant Suspension Bracket which is used at the doorway. This bracket, forms the connection between the two tracks. It allows a direct run from the STAR Double Oval Track to the Rod Track. This patented connection between the inside and outside track is a superior STAR feature which gives you the big advantage of being able to give the carrier a start while it is still inside the barn and depend upon it passing to the outside track with safety.

SPECIFICATIONS

STAR DOUBLE OVAL STEEL TRACK — described on page 220.

STAR DOUBLE OVAL STEEL TRACK HANGERS — described on page 220.

SWIVEL TRACKER WHEELS — 7 inches in diameter, have a lathe-turned tread. Each tracker wheel operates on 12 extra long, cold rolled steel bearings, surrounding a shouldered steel axle pin.

TRIPPING DEVICE — is so constructed that as soon as it hits the Trip Block the tub automatically releases the Double Latches and unlocks the tub at the bail. See Fig. 599. This device locks and unlocks the tub at both ends in unison.

RETURNING BUMPER — Insures the return of the carrier to the barn after dumping.

TUB — is made of heavy galvanized steel. Measures 25 x 41 inches and is 14 inches deep. The ends are of one piece with flanges formed on the edges, to which the body sheet is riveted and soldered, making it water-tight. The ends are reinforced with heavy galvanized plates; the top edges of the tub are reinforced with galvanized angle irons, both along the ends and sides; the corners are securely riveted, as is every joint in the construction of the tub. These tubs are indestructible; will not get out of shape; when dumped, are self-cleaning on account of the rounding bottom which permits of no corners in which litter can collect. The shape of the tub makes it possible to carry a large load.

SPRING KEEPERS—which are automatically thrown up into place as the carrier leaves the Double Oval Steel Track for the Rod Track. See Fig. 600. These keepers absolutely prevent the carrier from jumping the track, and also rigidly lock the wheels in line with the track and prevent their binding. As the carrier returns from the Rod Track to the Double Oval, these keepers are automatically thrown down to permit the operation of the carrier on the Steel Track, and to allow the tracker wheels to pass the track hangers. At the same time that the keepers are thrown down, the swivel trucks are unlocked so that the carrier will readily pass the curves and switches.

GIANT SUSPENSION BRACKET — supports the Ridg-Rod Connecting Track Coupling. See pages 221 and 222 for complete description.

TRIP BLOCK — is 9 inches long, is constructed of very best malleable iron and can be fastened to the Rod Track at any desired point.

ROD TRACK — for use outside of barn. Made of special drawn wire in two sizes, 0000 and 000000.

KEEPER RELEASE — a simple, unbreakable device which throws the keepers up as the carrier leaves the Steel Track for the Rod, preventing the tracker wheels from jumping the Rod Track and locking them in line. When the carrier returns to the Steel Track this device throws the keepers down so that the tracker wheels can pass the hangers and swivel on the curves.

SWITCHES, CURVES AND OTHER ACCESSORIES for STAR Double Oval Steel Track may be found on pages 220 to 222.

SWITCHES, CURVES AND OTHER ACCESSORIES for Rod Track may be found on pages 226 to 228.

No. 592 Litter Carrier — weight complete, 150 pounds. Finished in gray enamel.

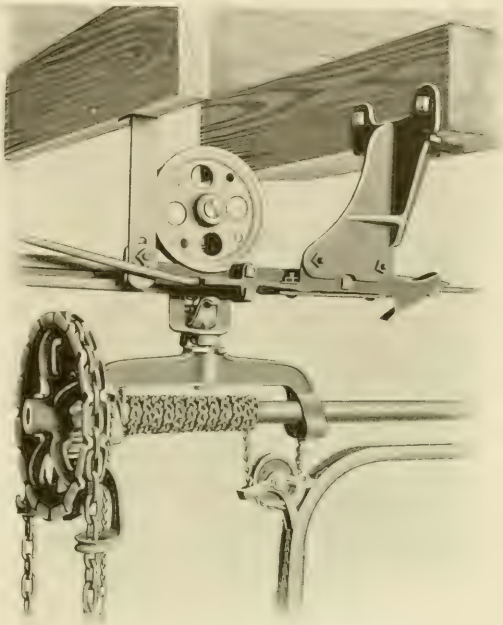


Fig. 600—Shows position of Spring Keepers and Suspension Bracket

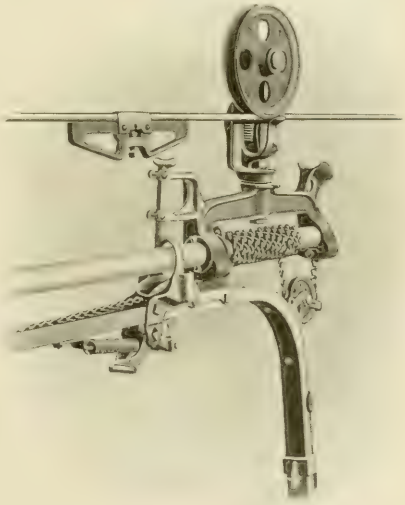
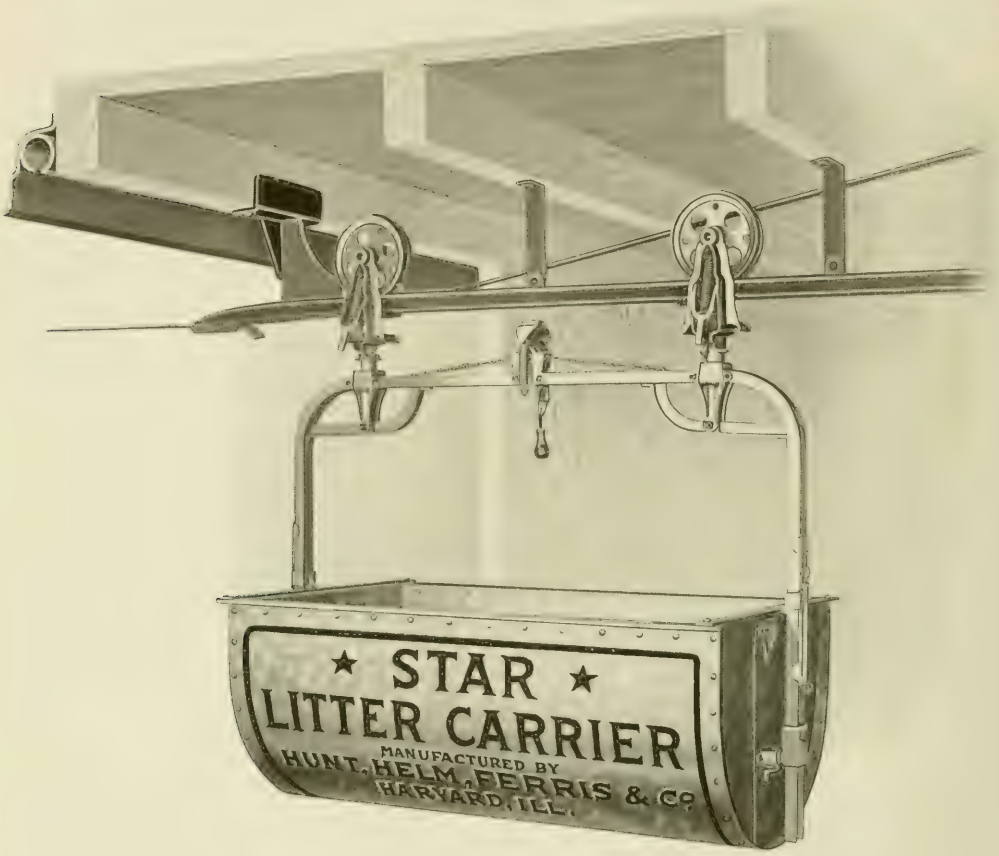


Fig. 599—Tripping Device



Reproduced from Actual Photograph of the

No. 693 Star Litter Carrier

Full Roller Bearing, for STAR Double Oval Steel Track Inside and Rod Track Outside

This Carrier Can Be Used on Rod Track Both Inside and Outside

THIS carrier was designed for operation on STAR Double Oval Steel Track inside the barn and Rod Track outside. With the exception that it is not equipped with the quick raising and lowering device, it is practically identical with the No. 592 STAR Litter Carrier illustrated and described on the preceding pages, in both operation and results obtained. This carrier is fitted with an adjustable bail so that the tub can be raised or lowered, when desired, a total distance of about 12 inches. It is recommended and guaranteed to do the work satisfactorily and with a minimum amount of labor.

No. 693 Star Litter Carrier

(Continued)

SPECIFICATIONS

STAR DOUBLE OVAL STEEL TRACK—detailed description on page 220.

STAR DOUBLE OVAL STEEL TRACK HANGERS—which slide along the groove in the Double Oval Track, may be placed at any desired point. Detailed description may be found on page 220.

TRACKER WHEELS—of gray iron, 7 inches in diameter. These wheels have a lathe-turned tread. Each revolves on 12 cold rolled steel bearings so that the carrier runs smoothly and easily.

SPRING KEEPERS—attached to the swivel trucks. These are automatically thrown into place when the carrier leaves the Double Oval Track and runs onto the Rod. These keepers absolutely prevent the carrier from jumping the track, and also rigidly lock the wheels in line with the track and prevent their binding. When the carrier leaves the Rod Track for the Double Oval, these keepers are automatically thrown down by a device permitting the tracker wheels to pass the hangers. The wheels are unlocked at the same time so that the swivel trucks of the carrier will operate readily on the Curves and Switches.

TRIPPING LEVER—made of malleable iron. This lever is connected with chains which release the latches, which lock the tub at both ends of the bail. When this lever strikes the trip block attached to the rod track in the yard, the latches are released instantly and the tub is allowed to turn over before the carrier returns automatically to the barn. Note that when this tripping lever is thrown down at the trip block it remains down so as not to retard the return of the carrier. It is returned to its natural upright position by a down pull on the small knob attached for that purpose.

THE CHANNEL STEEL BAIL—for raising and lowering of the tub by means of a simple adjustment, a total distance in all of 12 inches.

BAIL LATCHES—The tub is held rigidly upright by latches locking both ends. A chain running in the groove of the bail connects both latches with the tripping lever and operates them in unison.

MALLEABLE BRACES—securely riveted to the arch of the bail, forming a very solid construction.

LITTER CARRIER TUB—is made of heavy galvanized steel, heavily reinforced at both ends. Measures 26 x 41 inches and is 14 inches deep, and is so shaped that it is self-cleaning when dumped.

GIANT SUSPENSION BRACKET—detailed description will be found on pages 221 and 222.

SUPPORTS FOR WHEEL FRAME—which are riveted to both bail and bail braces, forming a rigid truss.

No. 693 STAR LITTER CARRIER—weight complete, 110 pounds. Finished in gray enamel.



STAR Carrier with STAR Track Running to Spreader Shed at STAR Equipped Barn, owned by Wm. Waller, Jr., Barrington, Ill.

No. 593 Star Double Oval Steel Track

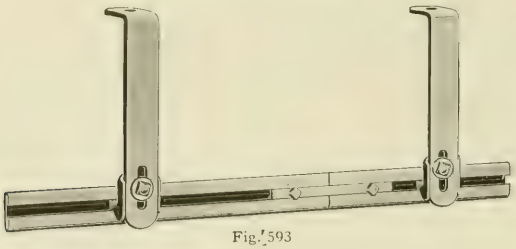


Fig. 593

STAR DOUBLE OVAL STEEL TRACK, a section of which is shown in Fig. 593, is used in connection with RIDG-ROD CARRIERS. Each section of track is formed of one piece of 16-gauge steel. The edges are rolled, leaving a slot which runs the full length of the piece. By rolling both edges, double rigidity is secured, the track having sufficient thickness as well as depth, so that it cannot sag nor buckle.

THE SPLICE Made of an extra long piece of steel which fits inside the track and bolts to each section, making a perfect joint. We guarantee the track to be as strong at the splice as at any other point. Splices furnished free with all orders for track.

STAR DOUBLE OVAL STEEL TRACK HANGERS, illustrated in Fig. 593, are made of $^1/_4$ x $1^1/_2$-inch steel. The 9-inch hanger is adjustable in length from $7^1/_2$ to 9 inches and covers all ordinary requirements. Longer hangers, as listed below, are furnished when necessary. The track can be raised or lowered after it is put up, and carefully leveled. Lag screws $2^1/_2$ x $^3/_8$-inches are used to fasten the hangers to the joists.

STAR Double Oval Steel Track Hangers furnished in following lengths:

Length	Weight per dozen	Clears
9 inches	14 lbs.	
15 "	20 "	6-in. beam
17 "	23 "	8-in. beam
19 "	26 "	10-in. beam
21 "	29 "	12-in. beam

Switches for Star Double Oval Steel Track

Switches for STAR Double Oval Steel Track are made of best grade malleable iron. The hinged section is quickly and easily operated by a down pull on either of the hand holds attached to the operating chain. When the switch is open, malleable iron safety locks automatically drop down, preventing the carrier from running off the open end. Both TWO AND THREE-WAY SWITCHES are furnished either right or left hand.

No. 598 TWO-WAY SWITCH for STAR Double Oval Track, either Right or Left hand Weight, each, 30 pounds.

No. 597 THREE-WAY SWITCH for STAR Double Oval Track, either Right of Left Hand. Weight, each, 35 pounds.

When ordering, refer to page 223.

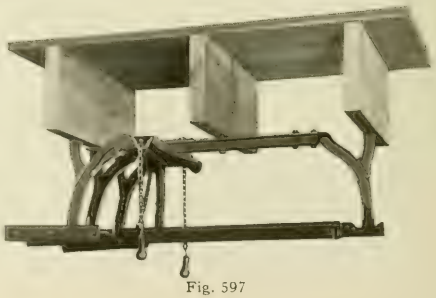


Fig. 597

No. 596 Curve for Star Double Oval Steel Track



Fig. 596

FIGURE 596 illustrates Curve for STAR Double Oval Steel Track, which is made of high carbon, round edge steel, size $^1/_4$ x $1^1/_2$ inches. This curve may be bent to any angle. It takes the place of eight feet of track. The ends of the curve are bolted into the ends of the regular STAR double oval track, making a rigid connection at each point.

The weight of the STAR Double Oval Steel Track Curve, complete, is 15 lbs. Hangers are packed separately.

Giant Suspension Bracket

Fig. 595 illustrates the Giant Suspension Bracket which is used to support the connection between double oval steel track in the barn and rod track outside. See Fig. 600 on Page 217.

The illustration here shows rod track secured to suspension bracket with coupling about to be placed in position. One end of this coupling fits snugly over the rod track. It is provided with an attachment which holds the rod track securely in place. The other end of the coupling fits into the end of the Double Oval Track and is bolted in place same as a splice, thus making a perfect and rigid joint.

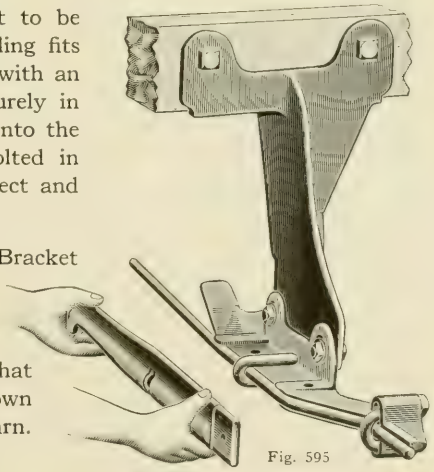


Fig. 595

If the sill to which the Giant Suspension Bracket is bolted is not perfectly level, the track connection can be leveled by the adjustment allowed in bolting it to the bracket. The coupling is so constructed that the keepers on the carrier are thrown down automatically as the carrier enters the barn. See Fig. 600 on Page 217.

Giant Suspension Bracket

(Continued)

The keepers being thrown down, permit the carrier trucks to pass the hangers which support the Double Oval Track and also allow them to swivel at curves. As the carrier leaves the barn, the keepers are thrown up into place so that the wheels cannot jump the rod track. The wheels are locked into line with the rod at the same time. This keeps them from binding, and reduces friction to a minimum.

The construction of the Giant Suspension Bracket and Coupling provides for a straight and smooth run from inside of barn to dump. There is no offset at barn door where rod and Double Oval track join. This is an exclusive patented feature with Star construction and solves the problem of a smooth connection at the door, which makes it possible to gather headway with the loaded carrier before it is given the final shove to the dump.

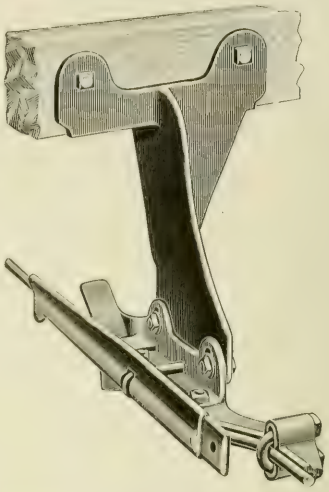


Fig. 594
Right Hand Giant Suspension Bracket

Giant Suspension Brackets are made either right or left hand. Right or left hand brackets are necessary because the frames supporting the tracker wheels on the carriers must, under all conditions, operate on the side of the track opposite to the side into which the track hangers attach. The right hand bracket is placed on the right hand side of the track looking out of barn. See Figure 594. The left hand bracket is placed on the left hand side of track looking out of barn. See Figure 702.

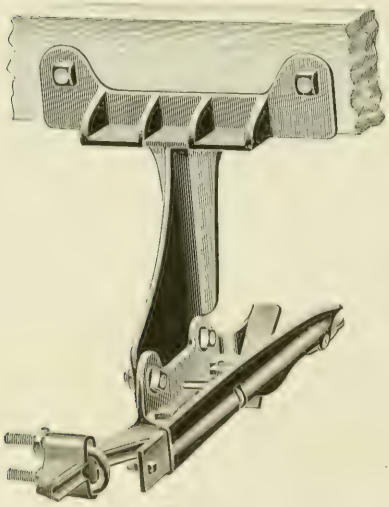


Fig. 702
Left Hand Giant Suspension Bracket

Either right or left hand suspension brackets will answer where switches are not used. If switches are used, it is always best to include a rough pencil sketch with the order to indicate the general direction that the track takes inside of the barn, in which case the proper suspension bracket and also the proper switch will be included in the shipment.

Giant Suspension Bracket, either right or left hand, weight, each, 14 lbs.

How to Order Carriers and Accessories for Star Double Oval Steel Track

CARRIER — Select by referring to pages 216 to 219.

TRACK—DOUBLE OVAL STEEL TRACK — To determine the amount of Double Oval Steel Track for use inside of barn, take measurements as though the track were to be installed with square turns, then deduct 8 feet of track for each curve not used in connection with a switch and 4 feet of track for each curve used with a switch. Double Oval Steel Track is furnished in 10-foot lengths only. By means of a hack saw shorter lengths can be cut as desired.

TRACK HANGERS — STAR Double Oval Steel Track Hangers, Fig. 599, are used to support the track inside the barn. These hangers should be spaced from 18 inches to 2 feet apart, according to the spacing of the joists. Nine inch hangers are sufficiently long except where it is necessary for the carrier to clear the beams supporting the joists. By referring to page 220 you can determine the length hanger necessary to clear any size beam.

GIANT SUSPENSION BRACKETS — A Giant Suspension Bracket, either right or left hand, is necessary at each point where the carrier runs from the Double Oval Steel Track, used inside of the barn, to the Rod Track, used outside. Either a right or left hand suspension bracket will answer where switches are not used. Right hand suspension brackets are placed on the right hand and left hand suspension brackets are placed on the left hand side of the track looking out of the barn. Where switches are used, it is always best to include a rough pencil sketch with the order to indicate the general direction the track takes inside the barn so that proper suspension bracket will be included in the shipment.

SWITCHES — Switches for Double Oval Track, either 2 or 3 way, are furnished either right or left hand. Specify 2 way switch where the track branches off to either right or left of the main line. Specify 3 way switch where track branches off to both right and left of the main line. Right hand switches, either 2 or 3 way, are used with right hand suspension brackets when the hinged end of the switch is nearest the suspension bracket. Right hand switch, either 2 or 3 way, is required when the hinged end of the switch is furthest away from a left hand suspension bracket. Left hand switch, either 2 or 3-way, is used with a left hand suspension bracket when the hinged end of the switch is nearest the suspension bracket. Left hand switch, either 2 or 3-way, is used where a right hand suspension bracket is used and where the hinged end of the switch is furthest away from the suspension bracket.

When ordering switches, it is always better to send a rough pencil sketch to indicate the general direction the track takes inside the barn, in which case the proper switches, also the proper suspension brackets, will be included in the shipment.

CURVES — Specify curve for Double Oval Steel Track at each point where the main track angles off. Also specify a curve for each 2-way switch and 2 curves for each 3-way switch used. These curves are shipped straight so they can be bent either to right or left and to any angle required.

END STOP — Specify one end stop, Figure 590, to keep carrier from running off end of Double Oval Track.

REMOVABLE SECTION — A removable section is a short piece of track arranged so that it can be lifted out, allowing a sliding door to be closed. While we do not illustrate a removable section for use with Double Oval Track, it can be furnished, if desired.

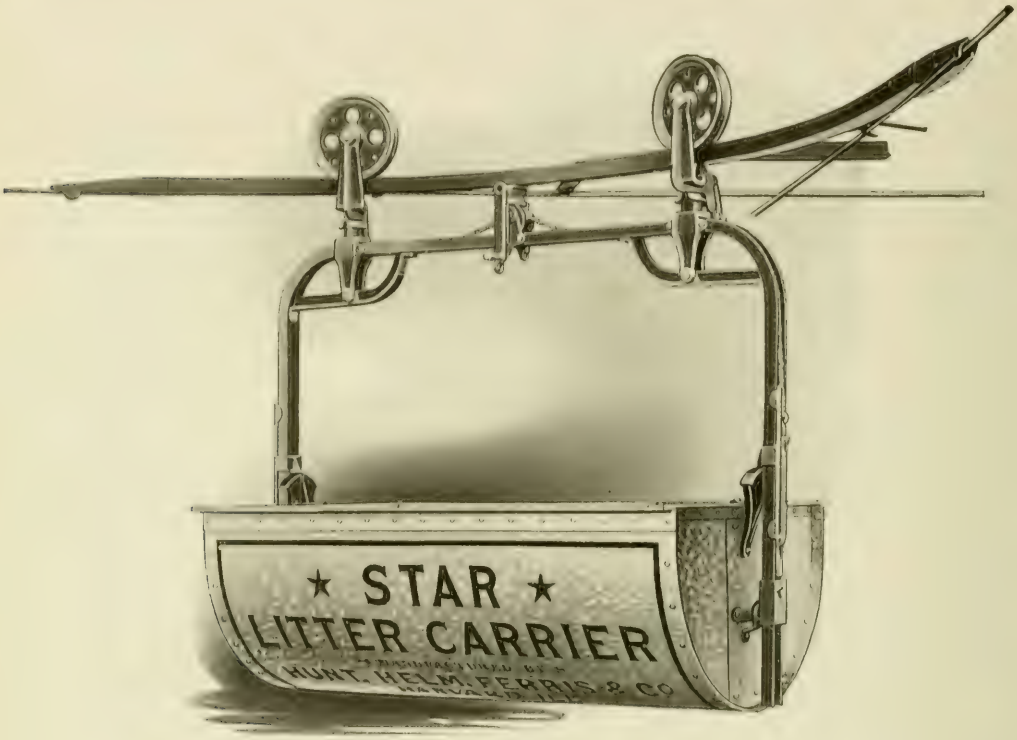
ROD TRACK—When ordering Rod Track for use out of doors, be sure to add at least 10 to 15 feet to the length required to provide for a suitable anchorage inside of the barn. The 0000 Rod Track is the size commonly used.

TENSION BOLT — Specify two 30-inch tension bolts for each stretch of Rod Track—one to be used at anchor post in the yard, the other to secure the Rod Track in the barn.

AUTOMATIC STOP AND RETURNER — Specify one for each carrier. See Figure 446, page 226.

ANCHOR ROD—Order one anchor rod for each stretch of Rod Track. We recommend the Anchor Rod and Turnbuckle, Fig. 353, page 227, as being the most practical.





Reproduced from Actual Photograph of the

No. 405 Star Litter Carrier

Full Roller Bearing, for Rod Track Inside and Outside of the Barn

THIS Carrier combines all the desirable and essential features necessary for a perfect Rod Track Conveyor. It is simple in construction and operation and perfectly built. In operation this carrier is automatic. By putting up the rod at the proper angle, the carrier, when loaded, can be made to run out and dump at the desired point by simply giving it a vigorous shove. When dumped, the empty carrier returns to the barn automatically. The tub of the carrier is dumped by means of a trip block which can be placed at any desired point on the rod. The tub dumps either way; locks at both ends and thus holds absolutely rigid. This tub has three adjustments and can be lowered or raised to the desired height. The tracker wheels are fitted with Spring Keepers, which lock them in perfect alignment with the rod, thus reducing friction to a minimum. These keepers also prevent the tracker wheels from leaving the rod.

SPECIFICATIONS

ROD TRACK — of special drawn wire. The 0000 size is adapted to meet the requirements of Litter Carrier outfits.

TRACKER WHEEL FRAME — constructed of best grade malleable iron, heavily ribbed, supporting a cold rolled axle pin upon which the tracker wheel turns. See Fig. 421.

TRACKER WHEELS — gray iron, 7 inches in diameter; lathe-turned tread of sufficient width, insuring perfect freedom from friction against the rod. The hub of each wheel is also lathe-turned, and revolves on 12 extra long, cold rolled steel bearings, surrounding a shouldered axle pin of special rolled steel. See Fig. 424.

SPRING KEEPERS — which prevent carrier from jumping the rod. These keepers automatically lock the tracker wheels in perfect alignment with the rod, thus preventing friction. They are automatically released when the tracker wheels strike the curve so as to permit the wheels to swivel.

LATCH TRIP — when the latch trip strikes the trip block the latches at either end of the tub are automatically released, allowing the tub to turn over.

BAIL—channel steel bail protects the trip chains and forms a rigid support for the tub at all times.

TUB LATCHES — one at either end of the tub. These latches automatically hold the tub in an upright position and keep it from sagging out of shape when loaded.

BAIL BRACES — are made of very best malleable iron, curved and bolted to the bail and the support for the wheel frame. These braces add great stiffness to the legs of the bail and keep them in perfect alignment.

TUB — galvanized steel throughout. The ends are of one piece with flanges formed on their edges to which the body sheet is riveted. The ends are reinforced with heavy galvanized plates, as are the top edges of the tub ends as well as the sides which are reinforced with galvanized angle iron. The corners are securely riveted as is every point in the construction of the tub. The tub is indestructible and self-cleaning on account of its shape. It is made in one size only: 24 inches wide, 41 inches long and 14 inches deep.

SUPPORT FOR TRACKER WHEEL FRAME — a malleable "U" shaped casting, engaged and riveted to both sides of the steel bail and bail brace, forming a truss of great rigidity.

ROD TRACK SWITCH OR CURVE — Fig. 354, page 226, made of high carbon angle. Fitted with malleable approaches. May be used either right or left hand.

No. 405 STAR LITTER CARRIER—weight complete, 110 pounds. Finished in gray enamel.

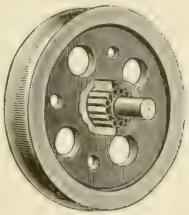


Fig. 424

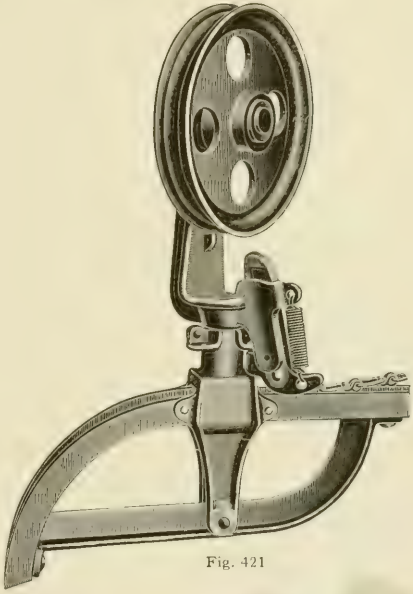


Fig. 421



STAR Equipped Barn of A. J. Love, Loveland Farms, Omaha, Neb.

Rod Track Accessories



Fig. 342

Fig. 342 illustrates the STAR Loop Clamp by means of which a loop can be formed quickly at either end of the rod track. Weight, each 1¾ pounds.

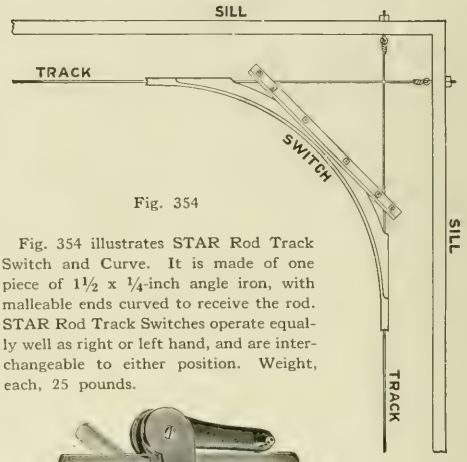


Fig. 354

Fig. 354 illustrates STAR Rod Track Switch and Curve. It is made of one piece of 1½ x ¼-inch angle iron, with malleable ends curved to receive the rod. STAR Rod Track Switches operate equally well as right or left hand, and are interchangeable to either position. Weight, each, 25 pounds.

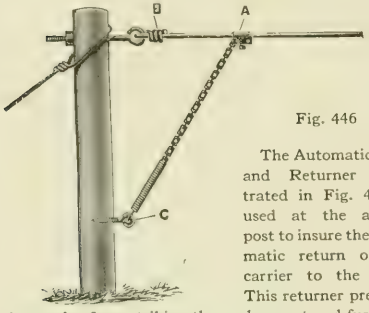


Fig. 446

The Automatic Stop and Returner illustrated in Fig. 446 is used at the anchor post to insure the automatic return of the carrier to the barn. This returner prevents the carrier from striking the anchor post and furnishes the necessary momentum for the automatic return without any tendency towards running the carrier off the rod. Weight, each 3½ pounds.

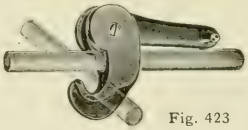


Fig. 423

Clamp for Rod Track, Fig. 423, is used at the intersection of two rod tracks to prevent sagging. Weight, each, 5 ounces.

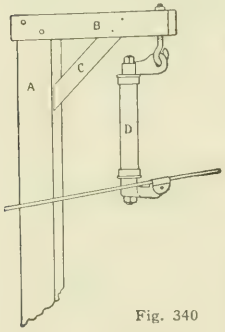


Fig. 340

Spring Track Support, Fig. 340, is used to take up the sag in rod tracks over 125 feet in length. Weight, each, 8¼ pounds.

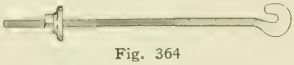


Fig. 364

Tension Bolt, Fig. 364. Length 30 inches. Thickness, ⅞ inch. Complete with washer and nut. Weight, each, 6½ pounds.

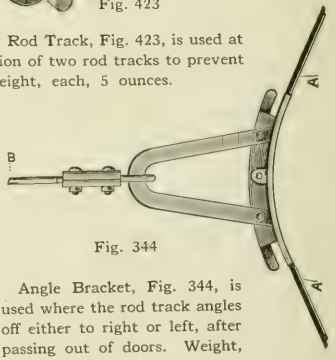


Fig. 344

Angle Bracket, Fig. 344, is used where the rod track angles off either to right or left, after passing out of doors. Weight, each, 3½ pounds.

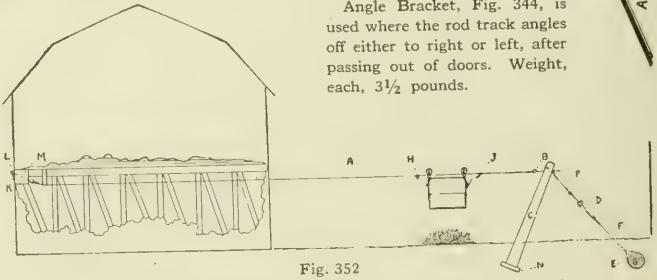


Fig. 352

Fig. 352 shows attachments of a rod track in barn and in yard.

Rod Track Anchors

THE successful working of a Rod Track outfit depends upon the ends of the rod being properly secured so as to prevent unnecessary sagging. In the yard an anchor post of suitable height should be used so that the end of the rod at the post can be elevated about 15 inches for every 100 feet of rod used above the end secured in the barn. This elevation insures the automatic return of the carrier after the tub is dumped.

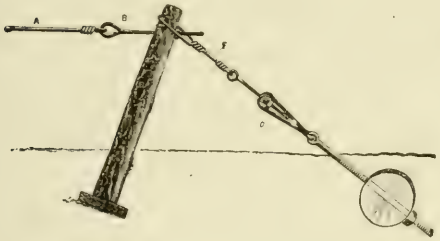


Fig. 353.—Rod Track, Anchor Rod and Turnbuckle

The Anchor Rod and Turnbuckle illustrated in Fig. 353 should by all means be secured. In addition to the 36-inch tension bolt used in connection with the turnbuckle for take-up purposes, a $\frac{5}{8}$-inch steel rod extends from the top of the ground, down thru the dead log. This steel rod will not rust out or break and overcomes any possibility of the anchor giving away below the ground line.

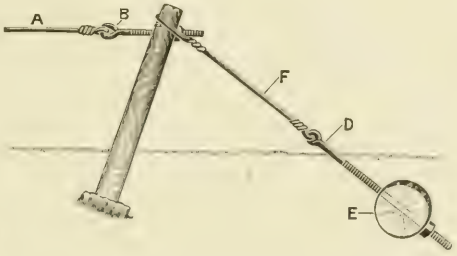


Fig. 375.—Anchor Rod and Tension Bolt

Fig. 375 illustrates a medium priced anchor for supporting the anchor post in the yard. This anchor is furnished with a loop in the rod track and with a 36-inch tension bolt, which extends through the dead log. Weight, each, 12 pounds.

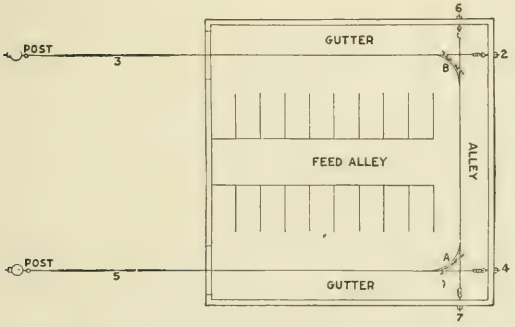


Fig. 356

Fig. 356 shows an illustration of a STAR Rod Track Litter Carrier outfit. Where one carrier is used for both sides of the barn, this arrangement is economical and practical.

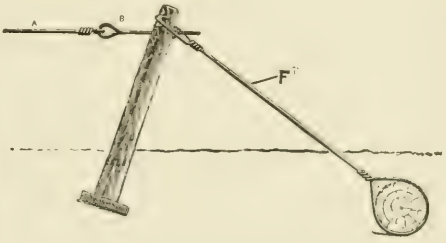


Fig. 374.—Anchor Rod

Anchor Rod, Fig. 374, illustrates a moderate priced method of anchoring post when supporting end of rod. This anchor is furnished complete with loops at either end. While not as convenient as the rod track turnbuckle, Fig. 353, it can be made to answer the purpose nicely. Weight, each, 10 pounds.

How to Order Carriers and Accessories for Star Rod Track

CARRIER Order the carrier illustrated on page 224 or 216.

ROD TRACK When ordering rod track, always specify over-all measurements as the proper allowance will be made for the thickness of the walls when the loops are formed. The Rod Track will be cut to length and looped when exact measurements are given.

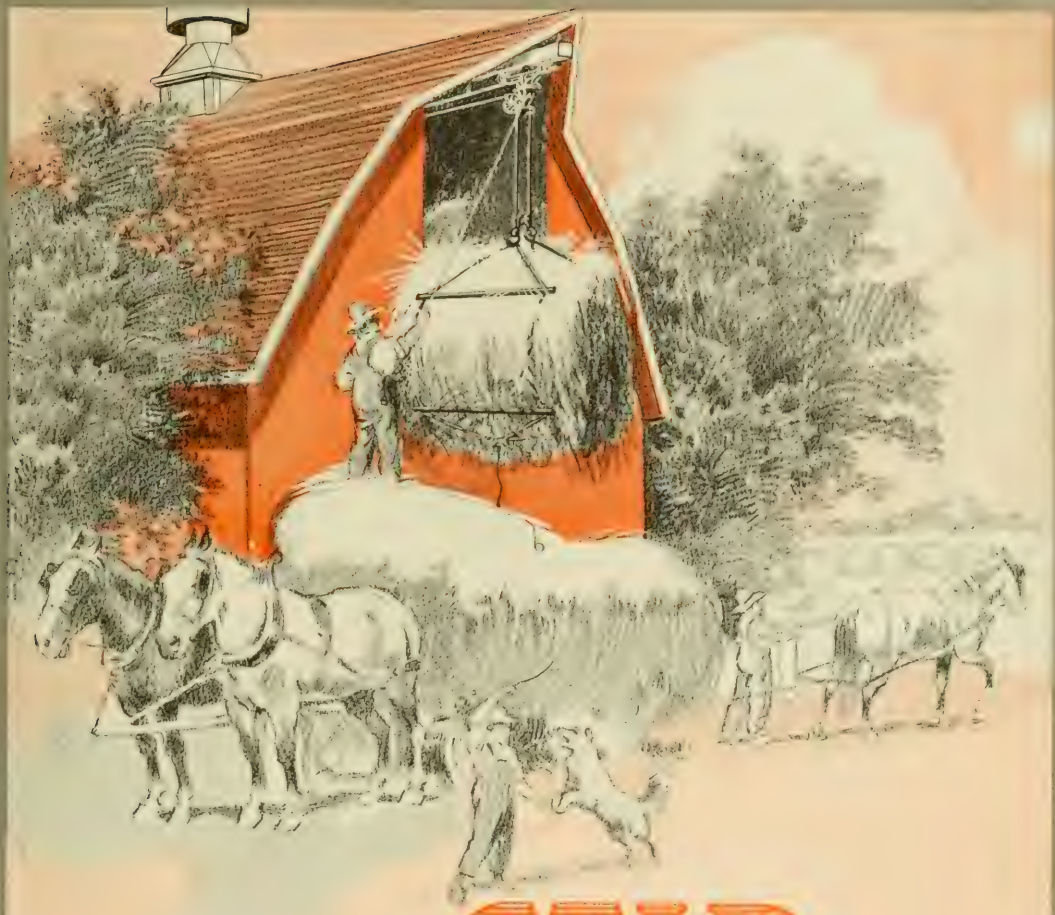
TENSION BOLT One tension bolt, Fig. 364, should be specified for each end of each rod track used.

ANCHOR Select one of the three anchors illustrated on page 38 for each anchor post used. Fig. 353 Anchor Rod and Turnbuckle is by all means preferable.

ROD TRACK CURVE, Fig. 354 This curve is adapted for making either a right or left hand right angle turn.

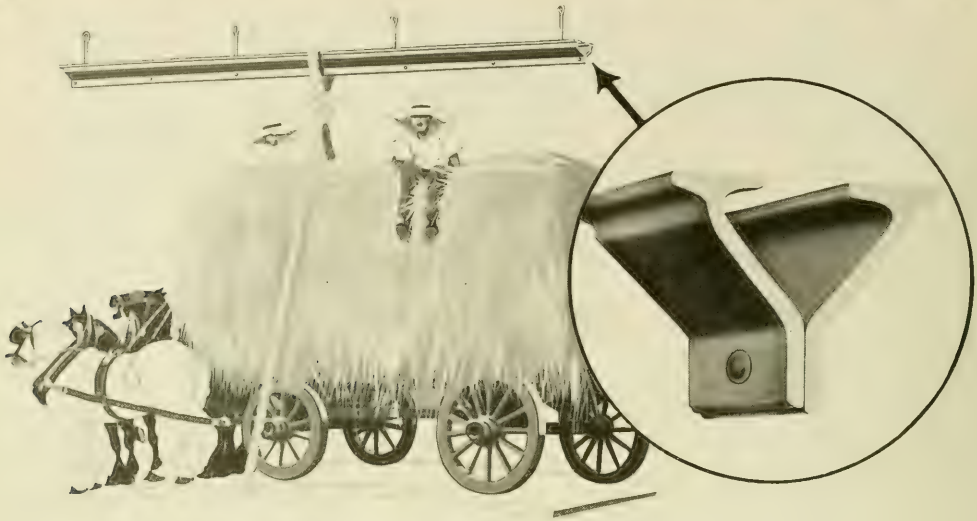
AUTOMATIC STOP AND RETURNER One should be ordered for each anchor post used.

It is very important for the successful working of a Rod Track outfit that the anchorage should be made absolutely secure. A Rod Track outfit is always practical as well as economical and will invariably give satisfaction where care is taken to see that the anchorage is secure. The anchor post should be securely set and the dead log should be buried so it takes a bearing against a solid bank of dirt. A firm anchorage permits taking up the sag of the rod. The success, however, of a perfect working rod track outfit depends on the care used in providing for a permanent anchorage.



STAR

Harvester Hay Tools



Strength Plus Durability

STRENGTH is the first thing to look for in a hay carrier track. Next you want durability.

You get the ideal combination in Star Track. You get a track 100% stronger than any other hay carrier track manufactured.

STAR hay carrier track is made of the same material as railroad rails.

Study the photograph in the circle above. Two special steel flanged bars, firmly riveted together. Absolutely rigid. Can not bend, buckle, twist or spring.

Strong enough to support many times the heaviest load you would ever put on it.

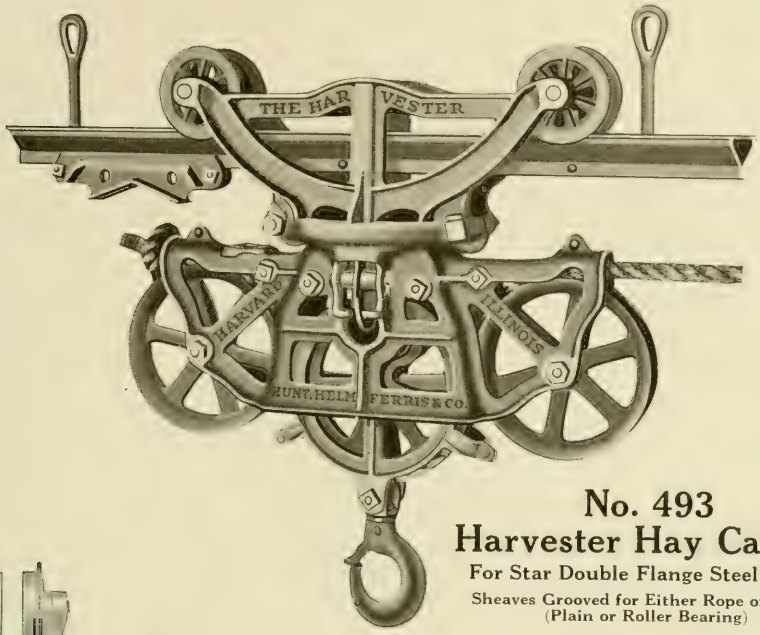
STAR Harvester Hay carriers have the same kind of quality you will find in STAR Track.



But it's the idle months that test the worth of a hay carrier. Few break the first season. You use the carrier once a year. The rest of the time it's idle.

STAR Track and Harvester Hay carriers are dependable. They are ready for service without delay or expense year after year. They are backed with years of service.

They are built extra strong where the strength is needed. They remain in service long after ordinary hay tools would be worn out.



No. 493
Harvester Hay Carrier

For Star Double Flange Steel Track

Sheaves Grooved for Either Rope or Cable (Plain or Roller Bearing)



Fig. 561

Fig. 561 shows transparent end view of locking parts used on all Harvester Fork Carriers. Note manner in which lock engages fork pulleys and holds load.

SPECIFICATIONS

NAME—Harvester, No. 493.

STYLE—Reversible Fork Carrier for Star Double Flange Steel Hay Carrier Track.

FRAME—Best gray malleable iron, fully reinforced.

HARVESTER NUT LOCK—Special Harvester Feature used to prevent the frame bolts from working loose. This is an exclusive feature with all Harvester Carriers and insures absolute rigidity.

WHEEL BASE—15½ inches, center to center.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, hub drilled to take special steel axle.

AXLE—This is a lathe-turned steel axle made by the most modern automatic machinery.

SHEAVES—7 inches in diameter, best gray iron, drilled to take steel axle. The three large sheaves on this Carrier are grooved for $\frac{7}{8}$-inch rope or $\frac{3}{8}$-inch wire cable, as desired.

BEARINGS—Sheaves on roller bearing carriers are fitted with eleven ¼-inch steel roller bearings, revolving on $\frac{5}{8}$-inch steel shoulder pin. On plain bearing carriers, the sheaves revolve on $\frac{5}{8}$-inch turned steel axle.

FORK PULLEYS—Improved design, fitted with 7-inch roller bearing sheave and self-closing fork hook.

SLING PULLEYS—Fig. 553, illustrated on page 258, may be used in place of fork pulley, as illustrated, thus allowing use of slings when desired.

SELF-CLOSING FORK HOOK—Special feature with all Harvester Carriers. By the use of this hook, the fork may be quickly detached. Much superior to the ordinary methods of attaching fork.

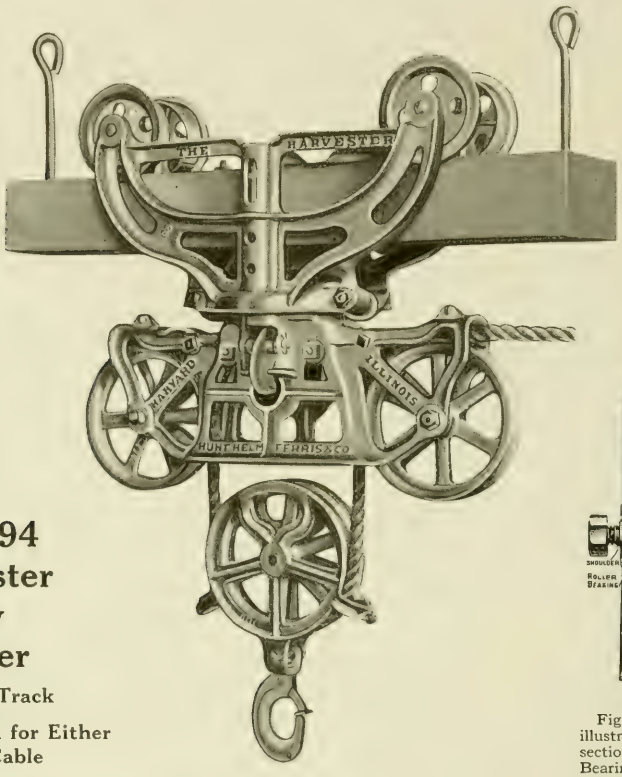
LOCK—Improved type of gravity lock. No springs to rust out or break. This lock embraces the double grapple principle, permitting pulley to enter at any angle and holding it securely. Simple in construction and positive in action.

TRIP-BLOCK—Made of best malleable iron, of special design, with a depression on the under side bolting over a rivet head on the track, thus making it absolutely impossible to loosen.

ROPE—This Carrier is fitted with sheaves so designed that it may be used with either ¾-inch or $\frac{7}{8}$-inch manila rope or $\frac{3}{8}$-inch wire cable and without any changing of the Carrier.

FINISH—Gray enamel. Roller bearing carriers trimmed in red. Plain bearing carriers trimmed in blue.

WEIGHT—Each, 50 lbs.



No. 494 Harvester Hay Carrier

For Wood Track

Sheaves Grooved for Either Rope or Cable

(Plain or Roller Bearing)

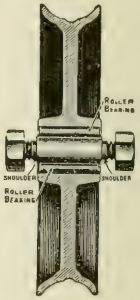


Fig. 556

Fig. 556 shows illustration of cross section of Roller Bearing Sheaves used in Harvester Hay Carriers Nos. 493, 494 and 496.

THE No. 494 Harvester Hay Carrier is similar to the No. 493 Harvester Hay Carrier illustrated on the preceding page, with the exception that the tracker wheels and trucks of this carrier are especially designed for Wood Track. Otherwise, the specifications covering the No. 493 Harvester Hay Carrier apply throughout. This is the heaviest type of Fork Carrier on the market. The design of the trucks assures more than ample strength for the heaviest load.

An extra long wheel base is provided. The distance from center to center of tracker wheels is 15¾ inches. 7 inch rope sheaves are provided to guarantee not only ease in operation but also the least possible wear on the rope. These sheaves are designed to take either ⅞ inch rope or ⅜ inch wire cable, as desired.

This extra heavy carrier can be depended upon to give extra service without any additional expense for up-keep. Weight, each, 54 lbs.

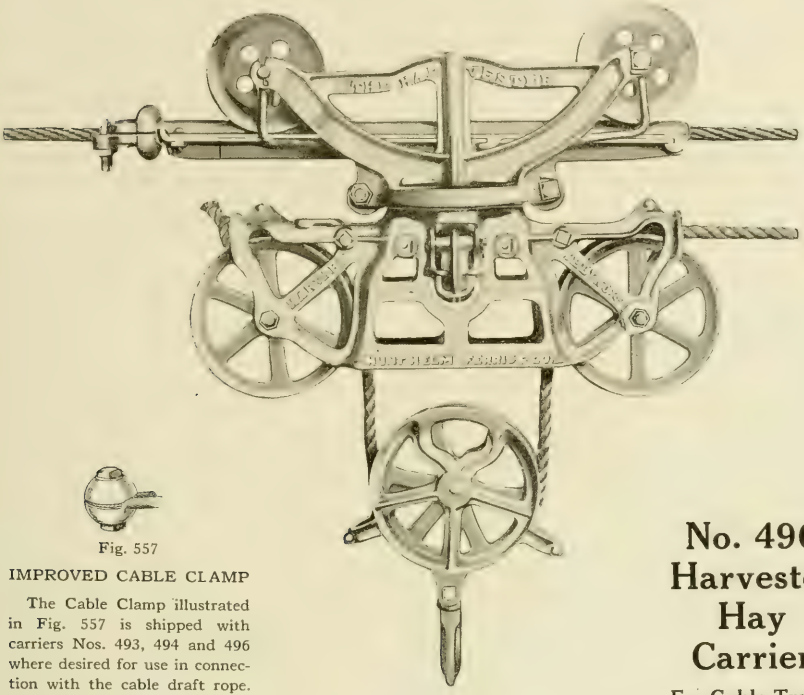


Fig. 557

IMPROVED CABLE CLAMP

The Cable Clamp illustrated in Fig. 557 is shipped with carriers Nos. 493, 494 and 496 where desired for use in connection with the cable draft rope. It is quickly and easily attached. It fits into a socket on the carrier where it turns or swivels freely, thus keeping the twist out of the cable.

No. 496 Harvester Hay Carrier

For Cable Track

Sheaves Grooved For Either Rope or Cable

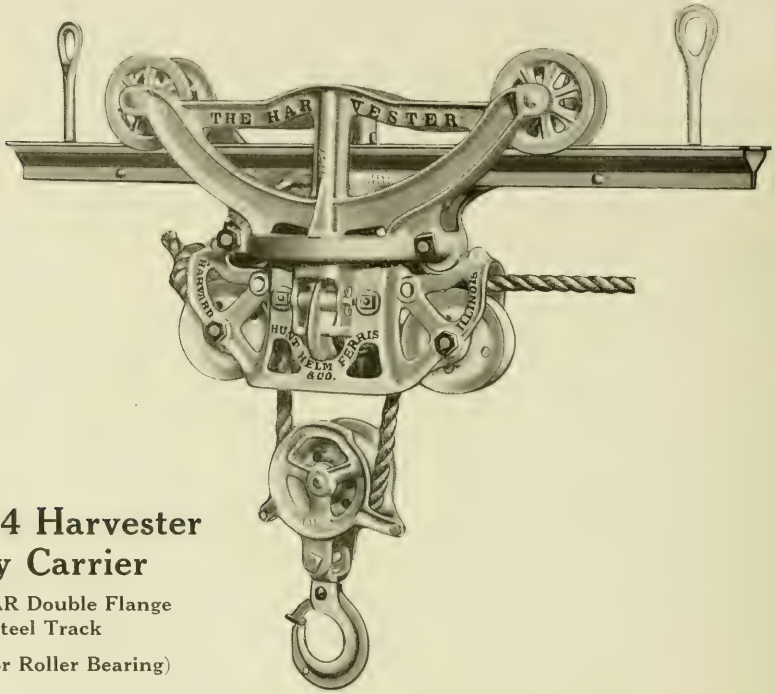
(Plain or Roller Bearing)

THE No. 496 Harvester Hay Carrier is similar to the No. 493 Harvester Hay Carrier illustrated on page 231, with the exception that the tracker wheels and trucks of this carrier are especially designed to operate on $\frac{5}{8}$ inch cable.

The trip block swings loose on the cable so that by gravity its position directly under the cable is maintained under all conditions. It can be located at any desired point or detached without taking down the cable itself.

This carrier has the same wheel base and the same extra large rope sheaves as are provided with the No. 493 and the No. 494 Harvester Hay Carriers described on the preceding pages. Its extra strength and oversize rope sheaves guarantee not only an easy operating carrier, but permanent service without any replacement expense of any kind.

Weight, each, 54 lbs.



No. 564 Harvester Hay Carrier

For STAR Double Flange Steel Track

(Plain or Roller Bearing)

SPECIFICATIONS

NAME—Harvester, No. 564.

STYLE—Reversible Fork Carrier for STAR Double Flange Steel Hay Carrier Track. Full roller bearing sheaves with frame of best grade malleable iron, fully reinforced. Frame provided with nut locks to prevent bolts from working loose, an exclusive feature on all Harvester Carriers, which insures absolute rigidity.

WHEEL BASE—15½ inches, center to center, with tracker wheels of best gray iron, 3 inches in diameter, the hub drilled to take special steel axle.

SHEAVES—Four-inch best gray iron sheaves.

BEARINGS—Sheaves on roller bearing carriers are fitted with eleven ¼-inch steel roller bearings, revolving on ⅝-inch steel shoulder pin. On plain bearing carriers, the sheaves revolve on ⅝-inch turned steel axle.

FORK PULLEYS—Latest design, mounted in heavy frame, fully reinforced. The fork pulley is supplied with self-closing fork hook, a special feature with all Harvester Carriers.

SLING PULLEYS—Fig. 553, illustrated on page 258, may be used in place of fork pulleys, allowing use of slings when desired.

LOCK—Improved type of gravity lock. No springs to rust or break. This lock embraces the double grapple principle, permitting pulley to enter at any angle and holding it securely. Simple in construction and positive in action.

TRIP BLOCK—Made of best malleable iron, of special design, with a depression on the under side bolting over a rivet head on the track, thus making it absolutely impossible to loosen.

ROPE—This Carrier is designed for use with rope and we recommend ¾ or ⅞-inch manila as being the most serviceable.

FINISH—Gray enamel. Roller bearing carriers trimmed in red. Plain bearing carriers trimmed in blue.

WEIGHT—36 pounds.



No. 502 Harvester Hay Carrier

For STAR Double Flange Steel Track

(Plain or Roller Bearing)

SPECIFICATIONS

NAME—Harvester, No. 502.

STYLE—Reversible Fork Carrier for Star Double Flange Steel Track.

FRAME—Best grade malleable iron, fully reinforced.

HARVESTER NUT LOCK—Special Harvester Feature used to prevent the frame bolts from working loose. This is an exclusive feature with all Harvester Carriers and insures absolute rigidity.

WHEEL BASE—11½ inches, center to center.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, wide flange, hub drilled to take steel axle.

AXLE—This is a lathe-turned axle, made by the most modern automatic machinery.

SHEAVES—4 inches in diameter. Best grade gray iron, drilled to take steel axle.

BEARINGS—Sheaves on roller bearing carriers are fitted with eleven ¼-inch steel roller bearings, revolving on ⅝-inch steel shoulder pin. On plain bearing carriers, the sheaves revolve on ⅝-inch turned steel axle.

SLING PULLEYS—No. 553, illustrated on page 258, may be used in place of fork pulley, as illustrated, allowing use of slings when desired.

FORK PULLEYS—Latest design, mounted in heavy frame which is reinforced at locking portion. All fork pulleys are supplied with self-closing fork hooks for holding fork, including a universal joint between fork pulley and self-closing fork hook, allowing great freedom of movement. Fork Pulleys are furnished with rope guards, making it impossible for rope to leave the sheave.

SELF-CLOSING FORK HOOKS—Special feature with all Harvester Carriers. By the use of these hooks a fork may be quickly detached. This hook is much superior to the ordinary method of attaching fork.

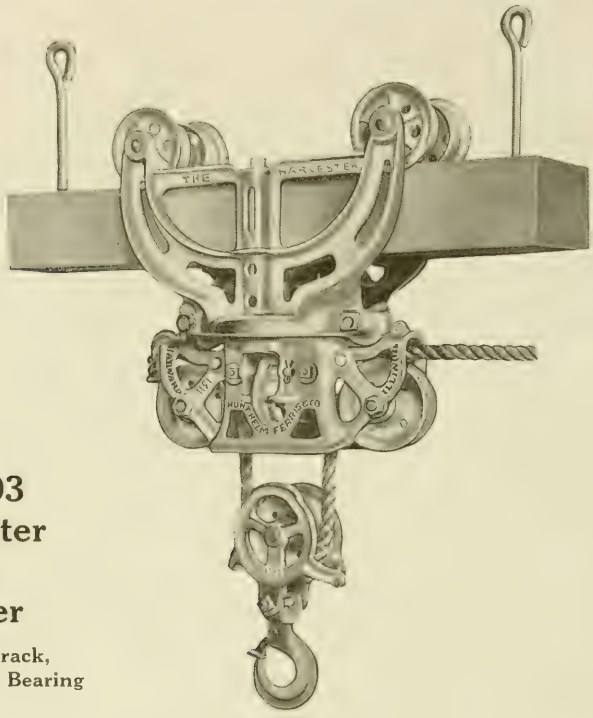
LOCK—Improved type of gravity lock. No springs to rust out or break. This lock embodies the double grapple principle, permitting pulley to enter at any angle and holding it securely. Simple in construction and positive in action.

TRIP BLOCK—Made of best malleable iron of special design, with a depression on the under side bolting over a rivet head on the track, thus making it absolutely impossible to loosen.

ROPE—This Carrier is designed for use with rope and we recommend ¾ or ⅞-inch manila as being the most serviceable.

FINISH—Gray enamel. Roller bearing carriers trimmed in red. Plain bearing carriers trimmed in blue.

WEIGHT—33 pounds.



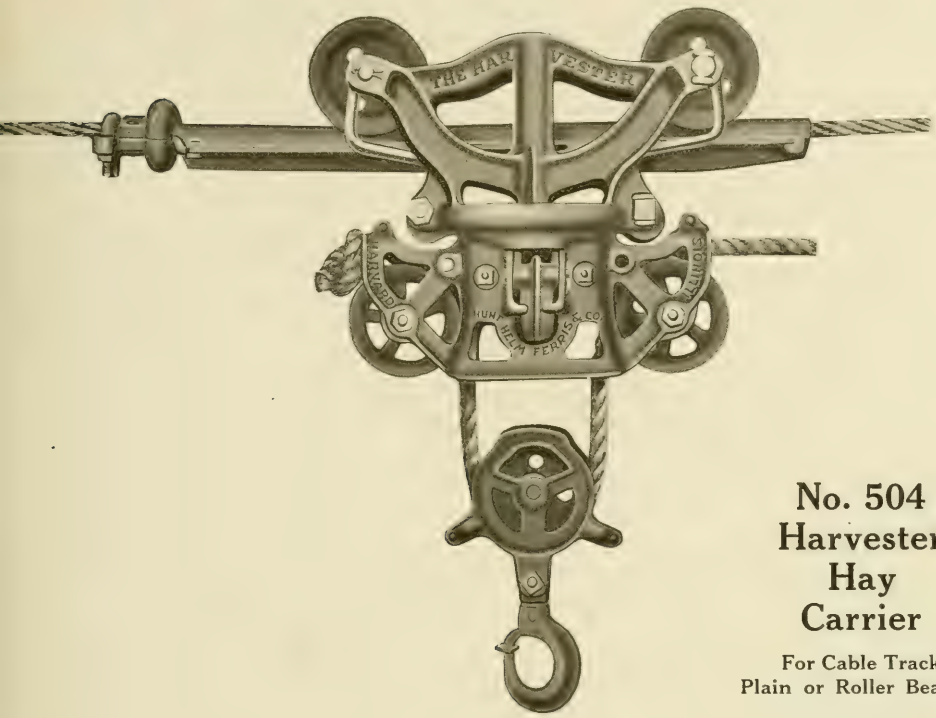
No. 503 Harvester Hay Carrier

For Wood Track, Plain or Roller Bearing

THE No. 503 Harvester Hay Carrier is similar to the No. 502 Harvester Hay Carrier illustrated on page 235, with the exception that the tracker wheels and trucks of this carrier are especially designed for WOOD track. Otherwise, the specifications covering the No. 502 Harvester Hay Carrier apply throughout.

This carrier was designed to combine strength with compactness. It has a wheel base of 12 inches from center to center of tracker wheels. Like all Harvester Carriers, it is equipped with gravity locks which operate without the use of springs of any description. The tracker wheels are of best gray iron, 3 inches in diameter at the tread, with wide flanges and hub drilled to take steel axle.

Weight, each, 37 lbs.



No. 504 Harvester Hay Carrier

For Cable Track
Plain or Roller Bearing

THE No. 504 Harvester Hay Carrier is similar to the Nos. 502 and 503 Harvester Hay Carriers, with the exception that the trucks and tracker wheels are especially designed to operate on $\frac{5}{8}$ in. cable.

The trip block swings loose on the cable and by gravity maintains its position directly under the cable, under all conditions. It can be located at any desired point or detached without taking down the cable. Like all Harvester Hay Carriers, the No. 504 is fitted with gravity locks operating without springs. Strength combined with practicability of design, assure uninterrupted service without additional expense of upkeep.

Weight, each, 38 lbs.



No. 575 Harvester Cross Draft Hay Carrier

Roller Bearing, for STAR Double Flange Steel Track

Also furnished for Wood Track, Specify No. 576

THE No. 575 Harvester Cross Draft Carrier is instantly adjustable to standard makes of Hay Carrier Tracks. With this carrier, the load is taken up at right angles to the track. No trip block is required. A pull on the draft rope immediately brings the carrier into position directly over the load. The rope grip instantly locks the moment the draft rope slackens. This makes it possible to take the hay into the mow at any height.

The right angle principle of the carrier itself assures even distribution over the mow. The Cross Draft Carrier effects a very material saving of draft rope because only enough to elevate load is required. A $\frac{5}{8}$-inch shift rope is used to move the carrier over the mow. The horses travel a less distance and are back at the barn by the time the carrier has returned from the mow.

This type of carrier is constantly gaining in favor on account of its simplicity of operation and because of the saving both in time and in rope.

This carrier is also designed for use on WOOD track. Specify No. 576.

No. 575 Harvester Cross Draft Sling Hay Carrier

SPECIFICATIONS

NAME—Harvester Cross Draft Carrier, No. 575. This Carrier is called "Cross Draft" because the draft rope runs directly across the barn to the team, not only making a natural saving in rope but also reducing friction to a minimum.

STYLE—Sling Carrier for Star Double Flange Steel Track. It is also made for wood track. Specify No. 576 for wood track.

ADJUSTMENT—This Carrier is so constructed that it can be adjusted to fit other steel hay carrier tracks. This is done by turning the right and left hand thread bolt which connects carrier legs as shown in illustration opposite. The Harvester Cross Draft Carrier is the only Carrier where the working parts are hinged on the adjusting bolt of the carrier legs, which allows working parts to adjust themselves and draw in direct line with the load, keeping ropes straight and free, preventing binding and cutting. The legs of this Carrier oscillate on the adjusting bolt, thus allowing every wheel to carry its part of the load. The oscillating or swinging feature allows Carrier with load to pass over an obstruction or full mow without additional strain on track or Carrier.

FRAME—Best grade malleable iron, fully reinforced. Extra heavy and long so as to distribute the load over a greater portion of the track.

WHEEL BASE—16¾ inches center to center of tracker wheels.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, wide flange, hub drilled to take steel axle.

AXLE—This is a lathe-turned steel axle made by the most modern automatic machinery.

SHEAVE—Eight inches in diameter, best grade gray iron, drilled to take large steel roller bearing axle.

SHEAVE BEARINGS—The large rope sheave turns on six special and extra large roller bearings contained in a housing, thus giving to the Carrier increased efficiency.

SLING PULLEYS—Malleable frame of improved design. Extra wide flanges with rolled edges, preventing chafing of draft rope. Pulley hooks are large enough to be used in connection with any style or make of rope or chain slings or in connection with forks. The hooks on sling pulleys are fitted with self-locking device, preventing slings or forks from becoming detached except at will of operator.

ROPE GRIP—This Carrier is provided with a rope gripping device having a 4-inch gripping surface and curved to conform to circle of large sheave. When hoisting rope is slackened, locking device travels with sheave, thus clamping rope securely and with absolutely no chafing. The small rope attached to the lever as shown in illustration, when pulled, releases grip on draft rope and allows slings to return to load.

TRIP BLOCK—No trip block is necessary with this Carrier, as the draft rope running at right angles to the track automatically brings carrier to position over the load.

ROPE—This Carrier is designed for use with rope only and we recommend ¾-inch or ⅞-inch manila as being the most serviceable.

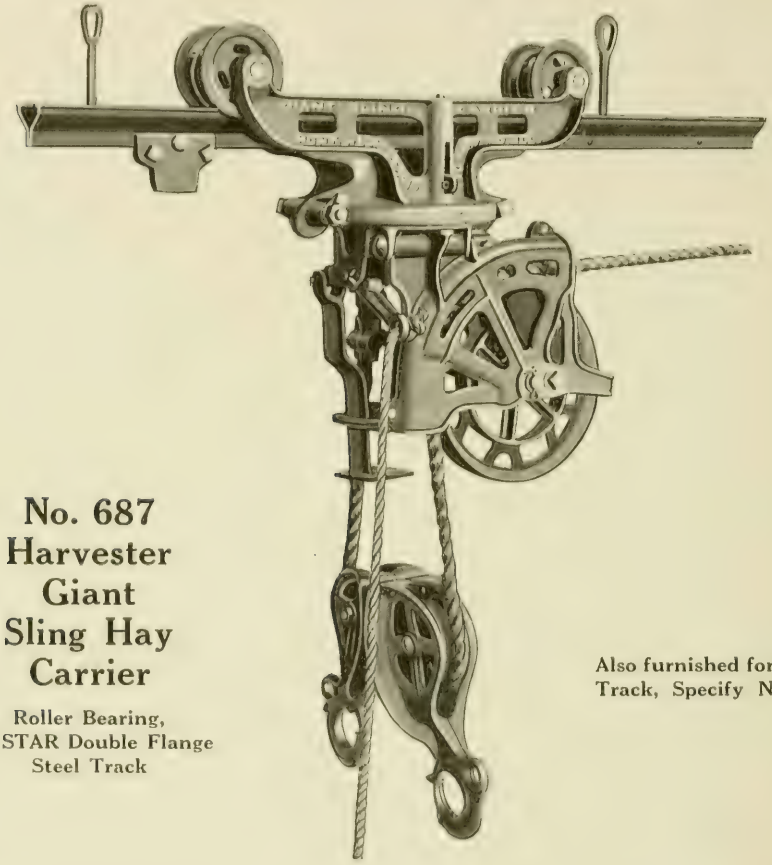
DIRECTIONS—Full set of directions and illustrations, explaining the simple manner in which this Carrier is roped and operated, is sent with each Carrier or mailed upon application.

FINISH—Gray enamel, trimmed in red.

WEIGHT—No. 575 Cross Draft Carrier, each 40 pounds. No. 576 for wood track, weight each 43 pounds.

GUARANTEE—We claim every Harvester Carrier to be perfect in workmanship and material. We back up our claim with a written Harvester guarantee attached to every Carrier shipped. Read this guarantee on page 2.





No. 687 Harvester Giant Sling Hay Carrier

Roller Bearing, for STAR Double Flange Steel Track

Also furnished for Wood Track, Specify No. 688

THE No. 687 Harvester Giant Sling Hay Carrier, as the name implies, is extra heavy and designed for extra service.

It is not necessary, unless desirable, to elevate the load to the carrier. A down pull on the trip rope illustrated, releases the carrier from the trip block and allows the load to be taken into the mow at any height. This carrier is equipped with an extra duty 4-wheel truck of sufficient strength to handle any load.

Note especially that this carrier is so designed that the load at all times is directly centered under the track so that it is equally distributed, each tracker wheel carrying its share of the weight.

The 9½-inch roller bearing rope sheave guarantees ease of operation without wear on the rope. The rope grip is designed to effectively hold the load without allowing the rope to either slip or chafe.

The design of this carrier provides not only for an even distribution of the load, but extra strength as well as extra service.

SPECIFICATIONS

NAME—Harvester Giant Sling Hay Carrier No. 687. So named because it is extra heavy and extra strong, designed for heavy work.

STYLE—Sling Carrier for STAR Double Flange Steel Track. It is also made for wood track. Specify No. 688 for wood track.

FRAME—Best grade malleable iron, fully reinforced. Extra heavy and large so as to distribute the load over a greater proportion of the track.

WHEEL BASE—17½ inches from center to center of tracker wheels.

TRACKER WHEELS—Gray iron. Three inches in diameter. Wide flange.

AXLE—Lathe-turned steel axle, made by automatic machinery.

SHEAVE—9½ inches in diameter. Best gray iron.

SHEAVE BEARINGS—The large rope sheave turns on six special, extra long roller bearings contained in a housing.

SLING PULLEYS—The sling pulleys provided with this Carrier are Harvester Long Neck Pulleys. These pulleys are made with a malleable frame of improved design, provided with automatic self-closing hook. The sling or fork snaps into this hook and can easily be detached, but, it cannot possibly be removed by accident. The hooks are large enough to be used in connection with any style or make of rope or slings or any style of fork. A wide throat with rounded edges prevents wear on the rope.

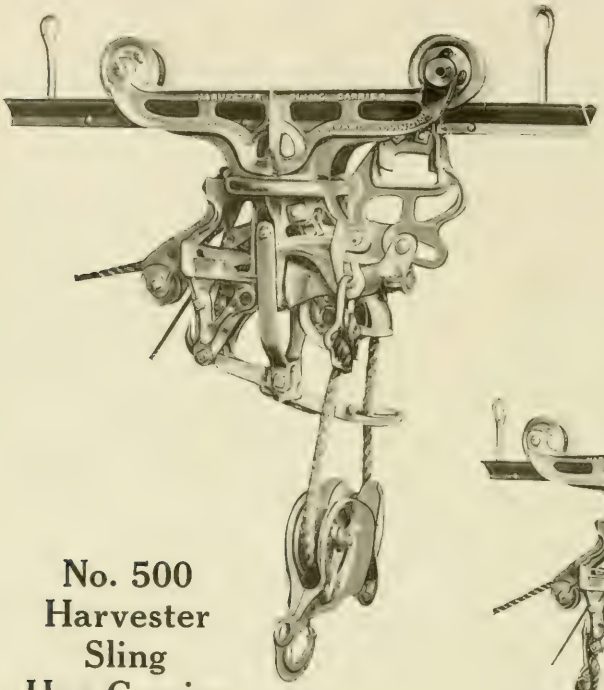
ROPE GRIP—This Carrier is provided with a rope gripping device which has a long gripping surface. This gripping surface conforms to the circle of the large wheel. When the hoisting rope is slackened the gripping surface travels with the wheel and sets gradually. This does not mean that the rope slips through the grip, but the grip travels with the rope and clamps firmly at the point where it first takes hold, without chafing or wearing the rope. The extra long gripping surface naturally insures a firm and safe purchase on the rope and holds it securely without chafing.

The trip rope attached to the lever as shown in the illustration locks the grip on the draft rope and at the same time releases the Carrier from the trip block. By using this trip rope it is not necessary to raise the load to the carrier as it can be taken into the barn at any desired height.

ROPE—¾-inch, ⅞-inch or 1-inch rope may be used. ⅞-inch pure manila rope recommended for best results.

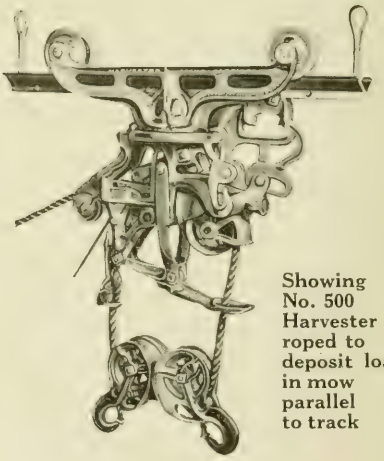
FINISH—Gray enamel, trimmed in red.

WEIGHT—No. 687 Giant Sling Hay Carrier, each 61 lbs.



No. 500 Harvester Sling Hay Carrier

(Note. Illustration shows Carrier roped to deposit load in mow at right angles to track)



Showing No. 500 Harvester roped to deposit load in mow parallel to track

THE No. 500 Harvester Sling Hay Carrier illustrated above is instantly adaptable to be used to handle the load at either right angles or parallel to the track.

The larger illustration shows the sling pulleys roped to drop the load at right angles to the track. The smaller illustration shows the sling pulleys roped to drop the load parallel to the track—simply by transferring the end of the rope from one hook to another. This is a patented exclusive feature of this carrier. This carrier is adapted for handling hay under all conditions—it is two carriers in one.

Note particularly that the tripping arm, also the frame of the large sheave, is hinged so that either may adjust itself in line of draft, thus preventing friction or the chafing of the rope.

For this same carrier to operate on WOOD track, specify No. 548, weight each, 51 lbs.

No. 500 Harvester Sling Hay Carrier

For Star Steel Track

SPECIFICATIONS

NAME—Harvester, No. 500.

STYLE—Reversible Sling Carrier for STAR Double Flange Steel Hay Carrier Track.

FRAME—Best grade malleable iron, fully reinforced, extra heavy and long wheel base so as to distribute the load over a greater portion of the track.

WHEEL BASE—17½ inches center to center of tracker wheels.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, wide flange, hub drilled to take steel axle.

AXLE—This is a lathe-turned steel axle made by the most modern automatic machinery.

SHEAVES—Two in number, made of best gray iron, drilled to take steel axles. Frame of large sheave is hinged to rope gripping lever allowing sheave to adjust itself in line of draft, thus preventing rope chafing over edge of sheave.

SHEAVE BEARINGS—Specially designed steel bearings.

SLING PULLEYS—Malleable frame of improved design. Extra wide flanges with rolled edges, preventing chafing of draft rope. Pulley hooks are large enough to be used in connection with forks. The hooks on sling pulleys are fitted with a self-locking device, preventing slings or forks from becoming detached except at will of operator.

ROPE GRIP—Five inch malleable iron rope grip so constructed that when pulleys strike tripping arm the lock slides forward and grips rope without chafing it and at the same time locks it securely. This operation automatically releases car from trip block. The heavier the load the greater the tension on the lock, with the result that it is impossible for the rope to slip through the grip. A special trip rope can be used with this carrier by the use of which the carrier is released from the trip block and load may be carried into the mow at any desired height.

TRIPPING ARM—Of special design, malleable iron and hinged to Carrier frame, allowing Carrier to be operated with pulleys at right angle or parallel to track without re-roping.

TRIP BLOCK—Made of best malleable iron, of special design, with a depression on the under side bolting over a rivet head on the track, thus making it absolutely impossible to loosen.

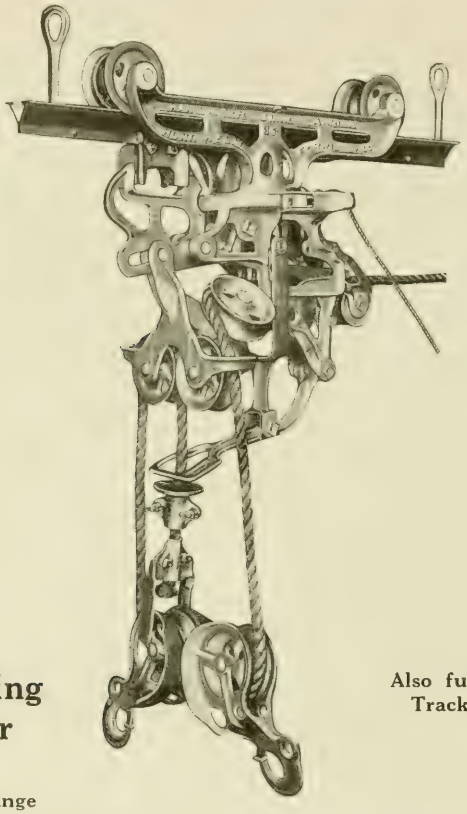
ROPE—This Carrier is designed for use with rope only and we recommend ¾-inch or ⅞-inch manila as being the most serviceable.

DIRECTIONS—Full set of directions and illustrations, explaining the simple manner in which this Carrier is roped and operated, is sent with each Carrier or mailed upon application.

FINISH—Gray enamel, trimmed in red.

WEIGHT—Harvester Carrier, No. 500, for steel track, 51 pounds.





No. 16 Harvester Sling Hay Carrier

Triple Draft for STAR Double Flange Steel Track

Also furnished for Wood Track, Specify No. 23

THE No. 16 Harvester Sling Hay Carrier was designed to meet the demand for a carrier to operate perfectly when roped triple purchase.

This carrier is exceedingly strong, is well balanced, and never fails to give satisfaction.

The adjustable rope clamp shown can be attached to the draft rope at any point desired and releases the carrier, permitting the load to be taken into the mow at any height.

This carrier combines all the improvements and is sold under the guarantee of all Harvester Hay Carriers.

This same carrier is also designed to operate on WOOD track. When ordering, specify No. 23.

No. 16 Harvester Sling Hay Carrier

For Star Steel Track

SPECIFICATIONS

NAME—Harvester No. 16.

STYLE—Reversible Sling Carrier for STAR Double Flange Steel Hay Carrier Track.

FRAME—Best grade malleable iron, fully reinforced, extra heavy and long wheel base so as to distribute the load over a greater portion of the track.

WHEEL BASE—17½ inches center to center of tracker wheels.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, wide flange, hub drilled to take steel axle.

AXLE—This is a lathe-turned steel axle made by the most modern automatic machinery.

SHEAVES—Four in number, made of best gray iron, drilled to take steel axles.

SLING PULLEYS—Malleable frame of improved design. Extra wide flanges with rolled edges, preventing chafing of draft rope. Pulley hooks are large enough to be used in connection with forks. The hooks on sling pulleys are fitted with a self-locking device, preventing slings or forks from becoming detached except at will of operator.

ROPE GRIP—Five-inch malleable iron rope grip so constructed that when pulleys strike tripping arm the lock slides forward and grips rope without chafing it and at the same time locks it securely. This operation automatically releases car from trip block. The heavier the load the greater the tension on the lock, with the result that it is impossible for the rope to slip through the lock. A special trip rope can be used with this carrier by the use of which the carrier is released from the trip block and load may be carried into the mow at any desired height.

TRIP BLOCK—Made of best malleable iron, of special design, with a depression on the under side bolting over a rivet head on the track, making it absolutely impossible to loosen.

ROPE—This Carrier is designed for use with rope only and we recommend ¾-inch or ⅞-inch manila as being the most serviceable.

DIRECTIONS—Full set of directions and illustrations, explaining the simple manner in which this Carrier is roped and operated, is sent with each Carrier or mailed upon application.

FINISH—Gray enamel, trimmed in red.

WEIGHT—Harvester No. 16, for steel track, 53 pounds; Harvester No. 23 for wood track, 55 pounds.

The No. 16 Harvester Hay Carrier as described above was especially designed to be used by those wishing to operate a sling hay carrier roped triple purchase.

With each carrier is furnished an adjustable trip casting as shown in the illustration, which is fastened at any point on the rope.

While the load is being elevated to the desired height the Carrier is held rigidly at the trip block. By the use of the Adjustable Trip, the carrier is automatically released when the load is at the desired height.

Harvester Carrier No. 16 has the same frame, wheel base, tracker wheels, axle, pulleys, lock, trip block, etc., as described in specifications for Carrier No. 500 and carries the same ironclad Harvester guarantee.



No. 142 Star Double Flange Steel Hay Carrier Track

SPECIFICATIONS

WE can prove the superiority of STAR over any hay carrier track on the market, irrespective of make or price. Read the specifications carefully.

MATERIAL—STAR Double Flange Steel Hay Carrier Track is made of high carbon steel of the same grade used in the manufacture of railroad rails.

CONSTRUCTION—STAR Double Flange Steel Hay Carrier Track is as simple in construction as it is strong and durable. It is really two tracks in one—the two special rolled steel bars being securely joined with rivets. These rivets are only eight inches apart, which makes the track rigid, therefore it will not bend, buckle, twist or spring.

STRENGTH—The strength of any track is in its thickness rather than in its width. It is a well known fact that any material set on edge will support a heavier load without bending than if laid flat. On this principle we constructed STAR Double Flange Steel Hay Carrier Track. It is guaranteed to be as strong at the splice as at any other place. By actual test we have found STAR Double Flange Steel Hay Carrier Track able to sustain nearly twice as heavy a load as any other hay carrier track manufactured.

HANGERS—STAR Track Hangers slide lengthwise of track, thus adjusting to any rafter bracket. Hangers may be put in or taken out if necessary without disturbing the track.

SPLICE—In Fig. 143 we show plainly the construction of a splice consisting of three pieces of malleable iron, one section inside of track and two sections outside, and so locked that they cannot become loosened. No drilling nor punching is necessary to fit splice blocks, as they are shipped complete.

TRIP BLOCK—All Trip Blocks used with STAR Double Flange Hay Carrier Track fit over the head of a rivet in the track. They cannot possibly jar loose or slide.

INSTALLATION—One of the most desirable features of STAR Double Flange Hay Carrier Track is the ease with which it is installed, requiring a wrench only to bolt the splice in place. The track is shipped complete, ready to install.

Star Double Flange Steel Hay Carrier Track and Fixtures



Fig. 142

The above illustration shows a section of STAR Double Flange Steel Hay Carrier Track. Furnished in 6 and 12 foot lengths. Wt. per ft., 2 lbs.

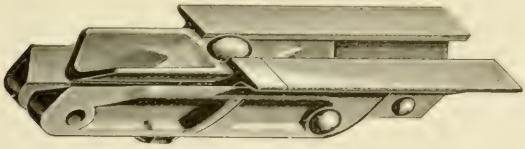


Fig. 143

The above illustration shows construction of Splice Block and method of holding track together. Wt. each, 1 lb.



Fig. 126

No. 126 Rafter Bracket, weight per doz., 3¾ lbs.



Fig. 573

No. 573 Adjustable Rafter Brackets, weight, per doz., 3¾ lbs.



Fig. 148

No. 148 Hanger for Double Flange Steel Track, weight, doz., 4 lbs.



Fig. 572

No. 572 Adjustable Track Hangers, weight per doz., 5¼ lbs.

ADJUSTABLE HANGER AND RAFTER BRACKET

By use of the adjustable hanger and rafter bracket, as shown in Fig. 572 and 573, the position of Hay Carrier Track can be accurately adjusted. This is particularly desirable where the rafters are uneven as in an old barn.

The track can be raised or lowered by adjusting the position of the nut on the hanger.

The bracket is so shaped that it holds the nut and prevents it from turning when the track is in use, as shown in Fig. 145.

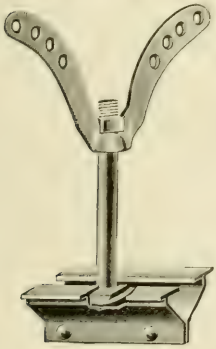


Fig. 145

OUTSIDE TRACK HANGER

Fig. 767 Outside Track Hanger for STAR Double Flange Steel Track. The above jointed track hanger is used to support STAR Double Flange Steel Hay Carrier Track at end of barn. Weight, per doz., 11 lbs.



Fig. 767

TRACK ROD AND END STOP

The Track Rod and End Stop in the illustration below, Fig. 72, is used at the end of track to prevent track from working endwise. Two end stops are included with each Carrier without charge, track rods being extra. Fig. 72 Track Rod, weight, per doz., 16 lbs.

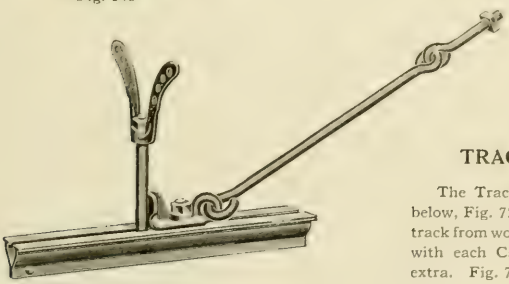
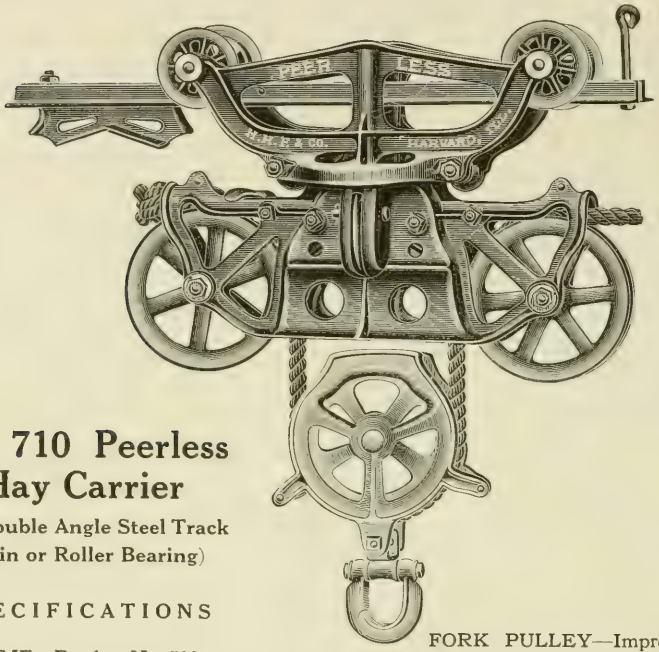


Fig. 72



No. 710 Peerless Hay Carrier

For Double Angle Steel Track
(Plain or Roller Bearing)

SPECIFICATIONS

NAME—Peerless No. 710.

STYLE—Reversible Fork Carrier for Peerless Double Angle Steel Hay Carrier Track.

FRAME—Best grade malleable iron, fully reinforced.

NUT LOCK—Used to prevent frame bolts from working loose, insuring absolute rigidity.

WHEEL BASE—15½ inches, center to center of tracker wheels.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, hub drilled to take steel axle.

AXLE—This is a lathe turned steel axle, made by the most modern automatic machinery.

SHEAVES—7 inches in diameter; best gray iron, drilled to take steel axle. The three large sheaves are grooved for ⅞-inch rope or ⅜-inch wire cable, as desired.

BEARINGS—Sheaves on roller bearing carriers are fitted with eleven ¼-inch steel roller bearings, revolving on ⅝-inch steel shoulder pin. On plain bearing carriers the sheaves revolve on ⅝-inch turned steel axle.

FORK PULLEY—Improved design built with 7-inch rope sheave and sister hook.

SLING PULLEYS—No. 553, illustrated on page 258, may be used in place of fork pulley illustrated, thus permitting use of slings when desired.

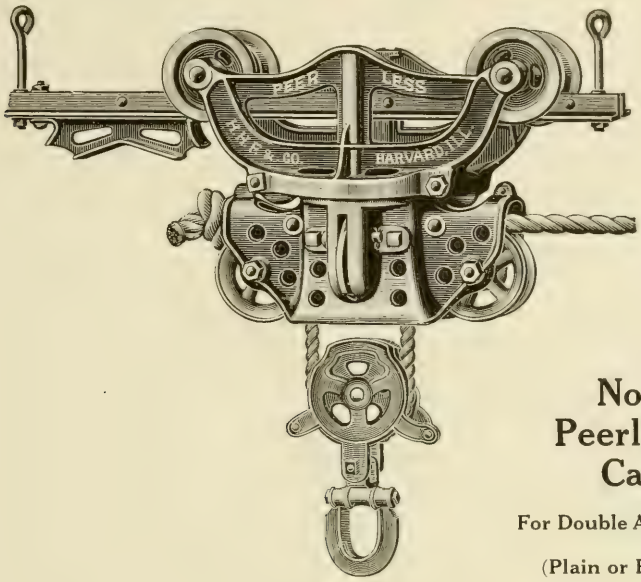
SISTER HOOK—Special feature with all Peerless Carriers. Constructed of two malleable iron castings, swiveling on steel bolt. This hook prevents fork from becoming detached except at will of operator.

LOCK—Improved type of gravity lock, grapple principle, no springs. Permits pulley to enter at any angle and holds it securely. Simple in construction and positive in action.

TRIP BLOCK—Made of best malleable iron, of special design, held securely to the track by two bolts.

ROPE—This carrier is fitted with sheaves so designed that it may be used with either ¾-inch or ⅞-inch manila rope or ⅜-inch wire cable without changing the carrier.

FINISH—Gray enamel. Roller bearing carrier, trimmed in red. Plain bearing carrier trimmed in blue. Weight, each, 49 pounds.



No. 707 Peerless Hay Carrier

For Double Angle Steel Track

(Plain or Roller Bearing)

SPECIFICATIONS

NAME—Peerless No. 707.

STYLE—Reversible Fork Carrier for Peerless Double Angle Steel Hay Carrier Track.

FRAME—Best grade malleable iron, fully reinforced.

NUT LOCK—Used to prevent frame bolts from working loose, insuring absolute rigidity.

WHEEL BASE—13 inches center to center of tracker wheels.

TRACKER WHEELS—Best gray iron 3 inches in diameter at the tread, hub drilled to take steel axle.

AXLE—Lath-turned steel axle is used.

SHEAVES—4 inches in diameter. Best gray iron, drilled to take steel axle.

BEARINGS—Sheaves on roller bearing carriers are fitted with eleven ¼-inch steel roller bearings, revolving on ⅝-inch steel shoulder pin. On plain bearing carriers, the sheaves revolve on ⅝-inch turned steel axle.

FORK PULLEY—Improved design built with 7-inch rope sheave and sister hook.

SLING PULLEYS—No. 553, illustrated on page 258, may be used in place of fork pulley illustrated, thus permitting use of slings when desired.

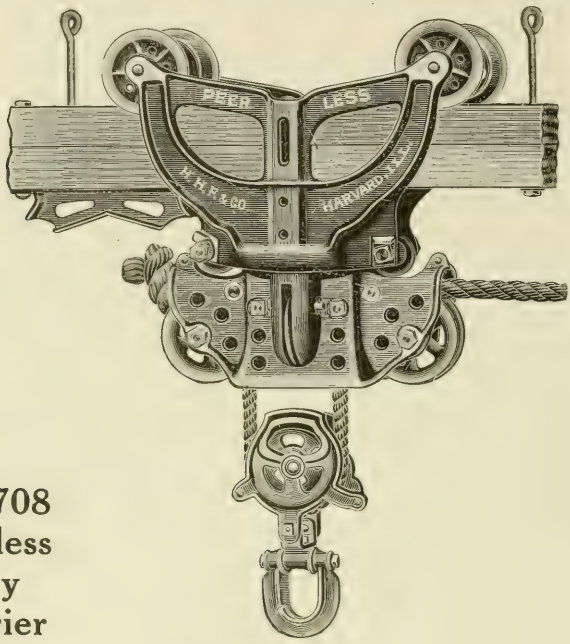
SISTER HOOK—Special feature with all Peerless Carriers. Constructed of two malleable iron castings, swiveling on steel bolt. This prevents fork from becoming detached except at will of operator.

LOCK—Improved type of gravity lock. Grapple principle permits pulley to enter at any angle and holds it securely. Simple in construction and positive in action.

TRIP BLOCK—Made of best malleable iron, of special design, held securely to track by two bolts.

ROPE—This carrier is fitted with sheaves so designed that it may be used with either ¼-inch or ⅞-inch manila rope.

FINISH—Gray enamel. Roller bearing carrier, trimmed in red. Plain bearing carrier, trimmed in blue. Weight, each, 37 pounds.



No. 708 Peerless Hay Carrier

For Wood Track

(Plain or Roller Bearing)

SPECIFICATIONS

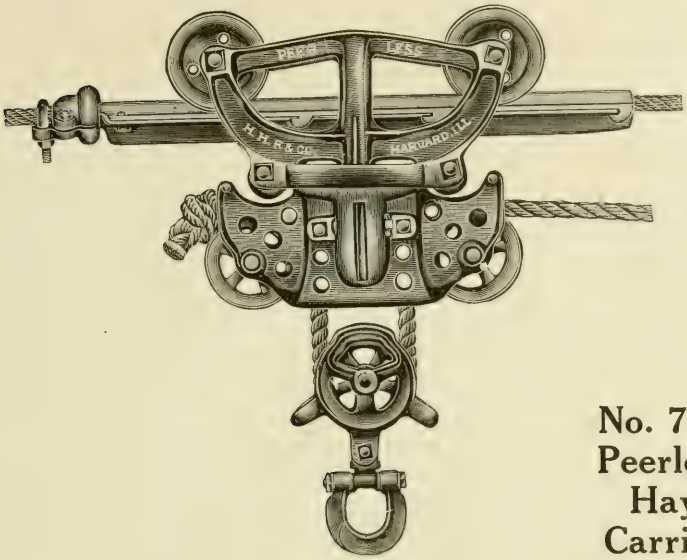
NUMBER 708 Peerless Hay Carrier is similar to the No. 707 Peerless Hay Carrier illustrated on the preceding page, with the exception that the trucks and tracker wheels were designed for use on WOOD track. Otherwise the specifications covering the No. 707 Peerless Hay Carrier apply throughout.

This carrier was designed to combine strength with compactness. It has a wheel base of 13 inches from center to center of tracker wheels.

The tracker wheels are the best gray iron, 3 inches in diameter at the tread, with wide flanges, hub drilled to take steel axle.

This is a dependable carrier designed to give prolonged service without additional cost or up-keep.

Weight each, 40 lbs.



No. 709 Peerless Hay Carrier

For Cable Track

(Plain or Roller Bearing)

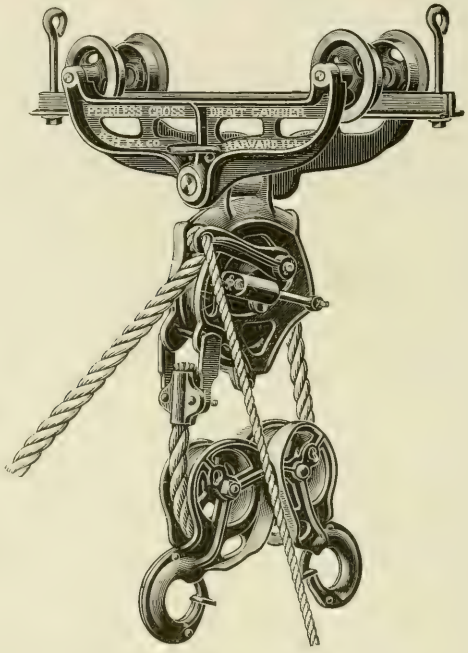
SPECIFICATIONS

THE No. 709 Peerless Hay Carrier is similar to the No. 707 Peerless Hay Carrier illustrated on page 249, with the exception that the trucks and tracker wheels of this carrier are designed to operate on 5-8 inch cable. Otherwise the specifications are the same.

The trip block swings loose on the cable and its position by gravity is maintained directly beneath the cable under all conditions. It can be located at any desired point or detached without taking down the cable.

The No. 709 Peerless Hay Carrier combines all the improvements and special features to be found in Peerless carriers. It is designed to give continuous service without up-keep expense.

Weight each, 40 lbs.



No. 705 Peerless Cross Draft Hay Carrier

For Wood Track
Specify No. 706

SPECIFICATIONS

NAME—No. 705 Peerless Cross Draft Carrier. This carrier is called Cross Draft because the draft rope runs directly across the barn to the team, not only making a material saving in rope, but also reducing friction to a minimum.

STYLE—Sling Carrier for Peerless Double Angle Steel Hay Carrier Track. If for use with Wood Track, specify No. 706.

ADJUSTMENT—This carrier is so constructed that it can be adjusted to fit other steel hay carrier tracks. This is done by turning the right and left hand thread bolt which connects carrier legs as shown in above illustration. The Peerless Cross Draft Carrier is the only carrier where the working parts are hinged on the adjusting bolt of the carrier legs, thus allowing working parts to adjust themselves and draw in direct line with the load, thus keeping ropes straight and free, preventing binding and cutting. The legs of this Carrier oscillate on the adjusting bolt, allowing every wheel to carry its part of the load. The oscillating or swinging feature allows Carrier with load to pass over an obstruction or full mow without additional strain on track or carrier.

FRAME—Best grade malleable iron, fully reinforced. Extra heavy and long so as to distribute the load over a greater portion of the track.

WHEEL BASE—16¾ inches, center to center, of tracker wheels.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, wide flange, hub drilled to take steel axle.

AXLE—This is a lathe-turned steel axle, made by the most modern automatic machinery.

SHEAVE—Six inches in diameter, best gray iron, drilled to take steel axle.

SLING PULLEYS—Malleable frame of improved design. Extra wide flanges with rolled edges, preventing chafing of draft rope. Pulley hooks large enough to be used in connection with any style of rope or chain slings or in connection with forks. The hooks on the sling pulleys are fitted with self-locking device, preventing slings or forks from becoming detached except at will of operator.

ROPE GRIP—This Carrier is provided with a gripping device or lock having a 4-inch gripping surface and curved to conform to circle of large sheave. When hoisting rope is slackened, locking device travels with sheave, thus clamping rope securely and with absolutely no chafing. The small rope attached to the lever as shown in illustration, when pulled, releases grip on draft rope and allows slings to return to load.

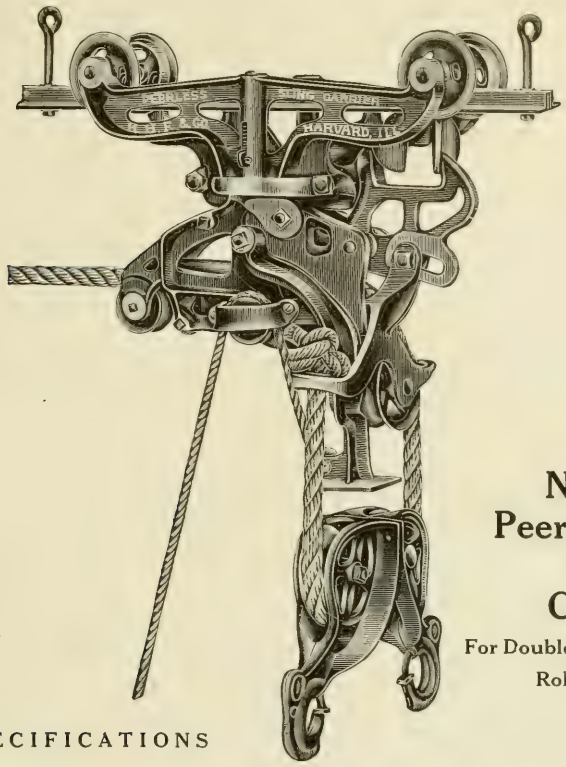
TRIP BLOCK—No trip block is necessary with this carrier, as the draft rope running at right angles to the track, automatically brings carrier to position over the load.

ROPE—This carrier is designed for use with rope only and we recommend ¾-inch or ⅞-inch manila as being the most serviceable.

DIRECTIONS—Full set of directions and illustrations explaining the simple manner in which this carrier is roped and operated is sent with each Carrier, or mailed upon application.

FINISH—Gray enamel, trimmed in red.

WEIGHT—No. 705 Cross Draft Carrier, weight, each, 36 lbs. No. 706 for wood track, weight, each, 40 lbs.



No. 704 Peerless Sling Hay Carrier

For Double Angle Steel Track

Roller Bearing

SPECIFICATIONS

NAME—Peerless No. 704.

STYLE—Reversible Sling Carrier for Peerless Double Angle Steel Hay Carrier Track.

FRAME—Best grade malleable iron, fully reinforced, extra long wheel base, so as to distribute the load over a greater portion of the track.

WHEEL BASE—17½ inches, center to center, of tracker wheels.

TRACKER WHEELS—Best gray iron, 3 inches in diameter at the tread, wide flange, hub drilled to take steel axle.

AXLE—This is a lathe-turned, steel axle, made by the most modern automatic machinery.

SHEAVES—Three in number, made of best gray iron, drilled to take steel axle.

SLING PULLEYS—Malleable frame of improved design. Extra wide flanges with rolled edges, preventing chafing of draft rope. Pulley hooks are large enough to be used in connection with forks. The hooks on sling pulleys are fitted with a self-locking device, preventing slings or forks from becoming detached except at will of operator.

ROPE GRIP—5-inch malleable iron rope grip, so constructed that when pulleys strike tripping arm the lock slides forward and grips rope without chafing it and at the same time locks it securely. This operation automatically releases car from trip block. The heavier the load the greater the tension on the lock, with the result that it is impossible for the rope to slip through. A special trip rope can be used with this carrier by the use of which the carrier is released from the trip block and the load may be carried into the barn at any desired height.

TRIPPING ARM—Of special design, malleable iron.

TRIP BLOCK—Made of best malleable iron, of special design, securely bolted to the track.

ROPE—This Carrier is designed for use with rope only and we recommend ¾-inch or ⅞-inch manila as being the most serviceable.

DIRECTIONS—Full set of directions and illustrations explaining the simple manner in which this carrier is roped and operated, is sent with each carrier, or mailed upon application.

FINISH—Gray enamel, trimmed in red.

WEIGHT—For steel track, 52 lbs.

No. 581 Peerless Double Angle Steel Hay Carrier Track



Fig. 581

The above illustration shows a section of Peerless Double Angle Steel Hay Carrier Track, made in 6 and 12 foot lengths.

SPECIFICATIONS

PEERLESS Double Angle Steel Hay Carrier Track is built of exactly the same material as is used in the construction of railroad rails. The two inch by inch steel angles, separated by iron spacers, are riveted firmly together.

Fig. 581 shows a section of Peerless Double Angle Steel Track. The heavy rivets holding the two angles together forming this track, are spaced 12 inches apart so that it is impossible for the track to bend, buckle or get out of line.

Fig. 582 shows this splice block by which the sections of Peerless Double Angle Steel Hay Carrier Track are joined. Each Splice Block consists of two sections of malleable iron held together by three heavy bolts. We guarantee this track to be as strong at the splice as at any other point. Sufficient splices for a complete installation are furnished with the track.

In supporting this track, either Hanger Fig. 584 or the Adjustable Track Hanger Fig. 588 can be used. The construction of the track permits these hangers to be spaced to conform to the arrangement of the rafters, regardless of the distance apart.

Rafter Bracket, Fig. 126, is used with Track Hanger, Fig. 584, as shown in illustration Fig. 583. The Adjustable Rafter Bracket, Fig. 573, is used in connection with the Adjustable Track Hanger, Fig. 588, as shown in Illustration Fig. 585.

Peerless Double Angle Steel Hay Carrier Track is not only strong and practical, but it is convenient to install. The only tool necessary is a wrench, one section being hung at a time and bolted in place.

Peerless Double Angle Hay Carrier Track Fixtures

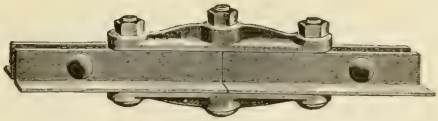


Fig. 582

The above illustration shows construction of Splice Block and method of holding track together.



Fig. 573

ADJUSTABLE RAFTER BRACKET



Fig. 590

END STOP

To keep carrier from running off end of track.



Fig. 126

PEERLESS RAFTER BRACKET

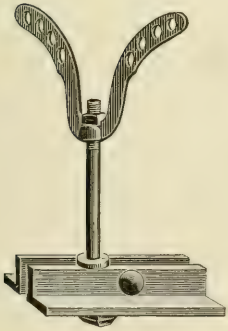


Fig. 585

ADJUSTABLE HANGER and RAFTER BRACKET



Fig. 588

ADJUSTABLE TRACK HANGER



Fig. 584

TRACK HANGER



Fig. 583

HANGER AND BRACKET

By use of the adjustable hanger and rafter bracket shown in Fig. 585, the position of the Hay Carrier Track can be accurately adjusted. This is particularly desirable where the rafters are uneven, as in old barns. The track can be raised or lowered after it is put up, by turning the nut on the hanger.

Wood Track Hangers and Other Fixtures

WOOD TRACK HANGER AND RAFTER BRACKET

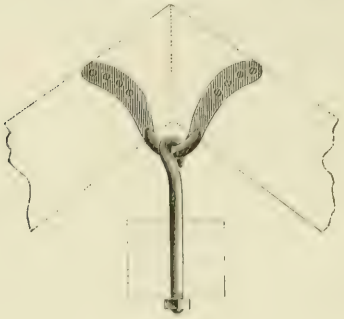


Fig. 79

By the use of this Hanger the track is hung directly in the center of the peak and has the full strength of both rafters.

RIDGE-POLE HANGER



Fig. 87

Made of the best malleable iron, of proper size to be used on ridge pole 2 x 6 or 2 x 8. By driving a nail in each slot it is made secure enough to hold any track.

Weight, per doz., 5½ lbs.

FLOOR HOOK

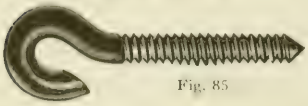


Fig. 85

No. 85 Weight, ⅝-in. hook, per doz., 8 lbs.
No. 85A—Weight, ¾-in. hook, per doz., 12½ lbs.

JOINTED TRACK HANGER



Fig. 83

Weight, per doz., 11½ lbs.

TRACK HANGER HOOK

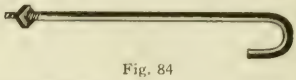


Fig. 84

Made in three sizes:
Weight, per doz., 12-in., 9¾ lbs.
Weight, per doz., 14-in., 10¾ lbs.
Weight, per doz., 16-in., 12 lbs.

WOOD TRACK HANGER

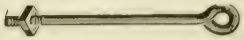


Fig. 131

10-inch

Weight, per doz., 8½ lbs.

RAFTER BRACKET



Fig. 126

Weight, per doz., 3¾ lbs.

SWIVEL ROPE HITCH AND HOOK



Fig. 86

One of the most handy and useful articles in a hay tool outfit. No hard knots to untie, no wasting of rope by cutting knots open. Twist in the rope is removed by the swivel.

Weight, per doz., 16 lbs.

Sling Pulleys and Sling Locks

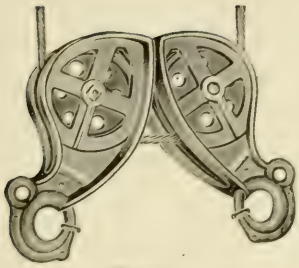


Fig. 641

Harvester Long Neck Pulleys

The Harvester Long Neck Pulleys or Stacking Pulleys as they care commonly called, as shown in Fig. 641, are used in connection with wire cable for stacking hay.

These are extra heavy long neck pulleys. They are provided with sheaves so grooved that rope may be used instead of cable if desired.

The edges of the throat are rounded and smooth so that they will not wear the rope. Each pulley is provided with an automatic self-closing sling hook, and a large eye to which rope may be fastened.

Harvester Long Neck Pulleys with 6½ in. sheaves, per set, weight, 15 lbs.

Harvester Long Neck Pulleys with 4 in. sheaves, per set, weight, 13 lbs.

Note: Be sure to specify size of sheave wanted.



Fig. 578

Harvester Fork Clevis

By use of the Harvester Fork Clevis illustrated in Fig. 578, any style of fork may be used with either parallel or right angle sling pulleys of any make. It is sometimes desirable to take off the greater part of the load with a fork and then to use a single sling for the remaining part as the sling takes up the hay cleaner than the fork.

This Fork Clevis is fitted with a swiveling sister hook to which any style of fork can be attached and made secure.

Hay Fork Clevis, Fig. 578, weight, each, 2 lbs.



Fig. 824

Sling Pulleys for Use with End Trip Slings

Fig. 824 illustrates Sling Pulleys especially adapted for use with End Trip Slings. The Sling Pulleys regularly furnished with Sling Carriers are adapted for use with Center Trip Slings.

Sling Pulleys, Fig. 824, for use with End Trip Slings, per set, weight, 14 lbs

END TRIP SLING LOCKS



Fig. 552

Single Hook Sling Lock

Fig. 552 illustrates the Single Hook Sling Lock provided with one large hook only, into which the braided loops at the end of the rope sling may be hooked.

This style of lock is especially desirable for use with home made slings.

Fig. 552, Single Hook Sling Lock, weight, each, 2 lbs.

Fig. 551, Double Hook Sling Lock (not illustrated) weight, each, 2 lbs.

The Triple Hook Sling Lock, as illustrated in Fig. 591, is provided with three hooks into which the rings attached to the ends of the ropes used in either two or three rope end trip slings, can be hooked. When this lock is released by the trip rope shown, the ends of the rope sling are also released.

Fig. 591 Triple Hook Sling Lock, weight, each, 2 lbs.



Fig. 591

Triple Hook Sling Lock

Sling Pulleys and Hay Slings



No. 553
Harvester Sling Pulley for use with Center Trip Slings

Harvester Sling Pulleys

Harvester Sling Pulleys are equipped with registering heads suitable for use with all Harvester and Peerless Fork Carriers when it is desired to use Slings instead of Forks.

Harvester Sling Pulleys can be used with any style or make of Fork Carrier provided they are equipped with the proper registering heads.

No. 553 Harvester Sling Pulley is for use with Center Trip Slings only.

No. 829 Harvester Sling Pulley is for use with End Trip Slings only.

Specify carefully which pulley is wanted. Weight, each, 10 lbs.



No. 829
Harvester Sling Pulley for use with End Trip Slings

Junior Rope Sling

Fig. 549 illustrates the Junior Rope Sling. It is made with two, ½-inch loose lay ropes that will not gnarl nor kink. Each rope has an adjustable take-up at one end so it can be shortened or lengthened as desired.

This same sling is also furnished with three ropes instead of two. When ordering specify Fig. 549A.

Weight, 2-rope Sling, Fig. 549, each, 5 lbs.

Weight, 3-rope Sling, Fig. 549A, each, 6 lbs.



Fig. 549
Junior Rope Sling

Junior Chain Hay Sling

Fig. 550 illustrates the Junior Chain Hay Sling made with two chains. This sling is constructed of non-kinking galvanized chain, guaranteed to be strong enough for all purposes.

Weight, Junior Chain Hay Sling Fig. 550, each, 6 lbs.

Note that the Sling Pulleys illustrated in Figures 549 and 550 are fitted with a triple hook sling lock, Fig. 591, illustrated and described on the preceding page. Where the Harvester Sling Pulley illustrated in Fig. 829 is used, this triple hook sling lock is not required.

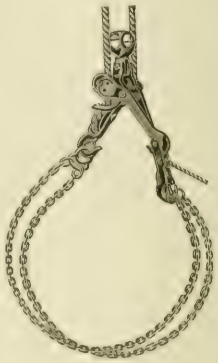


Fig. 550
Junior Chain Sling

Center Trip Adjustable Rope Sling

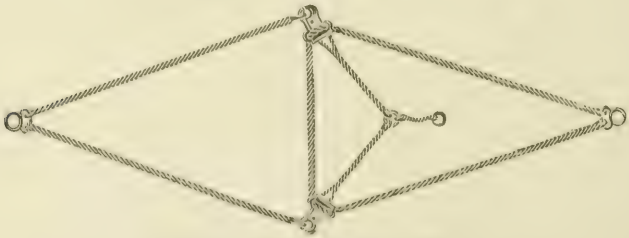


Fig. 480 Center Trip Adjustable Rope Sling

The Fig. 480 Center Trip Adjustable Rope Sling, as illustrated above, is a radical improvement over the old style End Trip Rope Sling. The double locks are operated in unison by a single trip rope. This sling is adjustable to any width. It is furnished in one size only, 16 feet.

Weight, each, 7 lbs.

Hay Slings

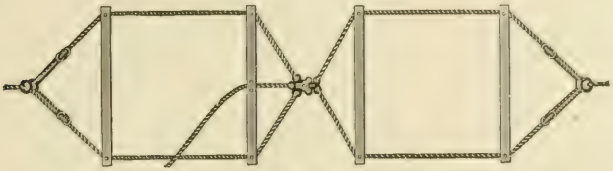


Fig. 55

O. K. CENTER TRIP SLING

Fig. 55 represents our O. K. Center Trip Sling, with 4-foot cross bars.

The ropes are ½-inch loose lay, are strong and will not gnarl nor kink. They have an adjustable take-up at either end so that they can be shortened or lengthened to suit the length of the hayrack.

The cross bars are heavy and strong, made of hardwood, in 4 and 5-foot lengths.

Weight, No. 55 Sling, 4-foot bars, 18 lbs.

Weight, No. 55A Sling, 5-foot bars, 21 lbs.

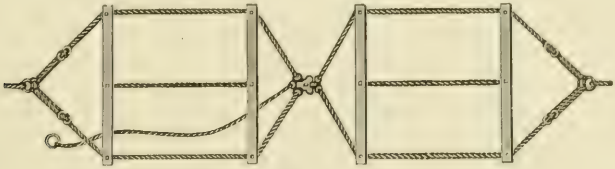
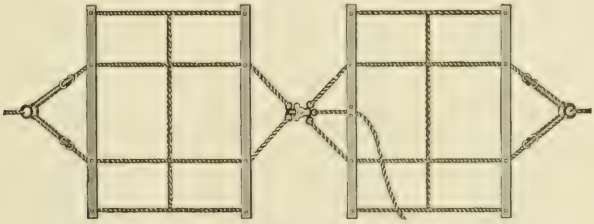


Fig. 58

O. K. CENTER TRIP SLING

Above we illustrate our O. K. Center Trip Sling, 5-foot bars, 3 ropes. This is the same style sling as shown in Fig. 55 with the exception of an extra rope running lengthwise.

Weight, No. 58 Sling, 23 lbs.



No. 56

HARVARD CENTER TRIP SLING

The Harvard Center Trip Sling is extra strong in every respect. It is made for heavy work. As this sling is specially roped, it forms a bed or net sufficiently close to carry fine hay or grain satisfactorily, no matter how short or dry. It is furnished with either 5 or 6-foot bars.

Weight, 5-foot sling, Fig. 56, each, 29 lbs.

Weight, 6-foot sling, Fig. 56A, each, 33 lbs.

Hay Slings

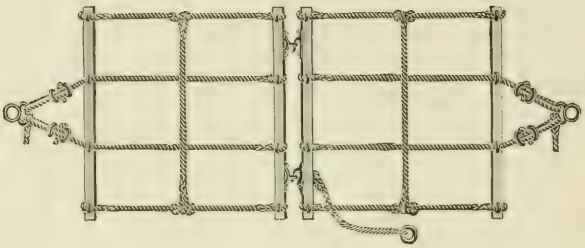


Fig. 769

HARVARD DOUBLE LOCK CENTER TRIP SLING

The Harvard Double Lock Center Trip Sling, illustrated above, is adapted for handling hay, fodder, or large bundles of grain. Two sets of locks are used to join the two halves of the sling instead of one. This double lock device makes two separate connections—a hook and eye being used at one end of the bars and a lock at the other. This double connection makes the sling especially strong at the point of greatest strain and balances the load at the same time. This sling is connected and locks with the same motion and can be instantly shortened or lengthened to fit the hay rack. It is a very popular sling because of the constantly increasing demand for a sling to carry large and very heavy loads.

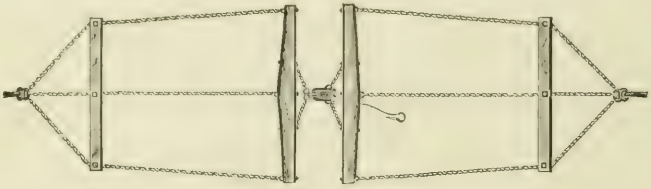


Fig. 395

CHAIN HAY SLING

Owing to the large demand we are now able to furnish a Chain Hay Sling, which we recommend for heavy work, such as is expected in the use of Sling Hay Carriers. Extra strong non-kinking galvanized chain is used. Note that the bars next to the sling lock are thicker at the center than at the end and that the outer bars are shorter than the bars next to the sling lock, thus insuring great strength. The two center bars come closely together, only 14 inches apart, thus small bundles may be raised without becoming loosened or falling out of the Sling.

This sling corresponds to our 5-foot O. K. Center Trip Rope Sling, Fig. 58.

Weight, each, 30 lbs.

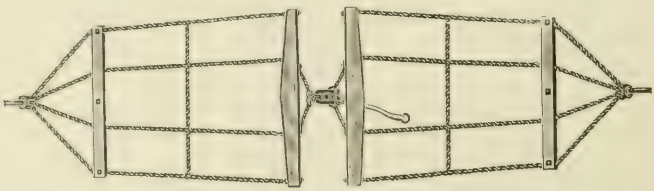


Fig. 479

CHAIN HAY SLING

Fig. 479 illustrates a Chain Hay Sling, 4 chains lengthwise, one chain across. This sling corresponds to our 6-foot Harvard Center Trip Rope Sling, Fig. 56A, and it is especially designed to carry fine stuff. Weight, each, 35 lbs.

Hay Fork Pulleys

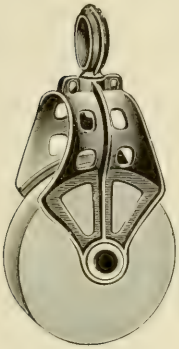


Fig. 103

MALLEABLE FRAME KNOT-PASSING PULLEYS

Fig. 103 represents our special design Malleable Frame Knot-passing Pulley. It has 6-inch sheave, which revolves on large hollow pin; sheave is made of hard maple. The eye is malleable swivel. The frame is made of the best malleable iron.

Weight, dozen, 34¾ lbs.

Fig. 104 shows the same frame with 6-inch cast iron sheave. The sheaves are interchangeable. These pulleys are warranted to give satisfaction.

Weight, dozen, 45 lbs.

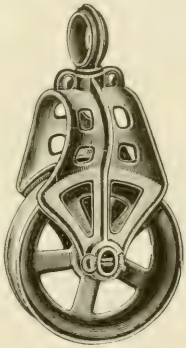


Fig. 104

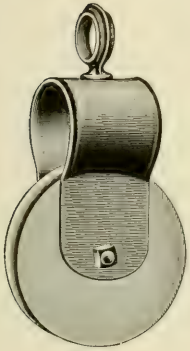


Fig. 105

STEEL FRAME KNOT-PASSING PULLEYS

Fig. 105 illustrates our Steel Frame Knot-passing Pulley. It has 6-inch hard maple sheave, which revolves on large bushing. Frame is pressed out of wrought steel; has malleable swivel eye.

Weight, dozen, 36½ lbs.

Fig. 106 represents same frame with 6-inch cast iron sheave. The sheaves are interchangeable.

Weight, dozen, 52 lbs.

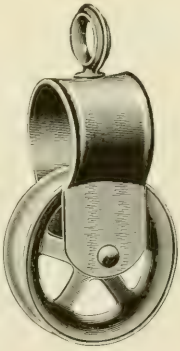


Fig. 106

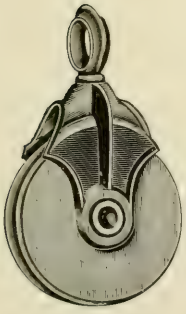


Fig. 101

CAST FRAME PULLEYS
Hollow Pin

Fig. 101 represents our Cast Frame Pulley, made after our own special design. It has 6-inch hard maple sheave, revolving on large hollow pin.

Weight, dozen, 37 lbs.

Fig. 102 represents the same frame with 6-inch iron sheave. Sheaves are interchangeable.

Weight, dozen, 48 lbs.

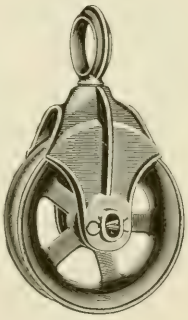


Fig. 102

Hay Fork Pulleys



Fig. 107

STEEL FRAME PULLEYS

Fig. 107 illustrates our Plain Steel Frame Pulley. The frame is made of wrought steel, with malleable swivel eye. The sheave is made of hard maple; is 6 inches in diameter, revolving on large bushing.

Weight, dozen, 26 lbs.

Fig. 108 represents same frame with 6-inch cast iron sheave. The sheaves are interchangeable.

Weight, dozen, 40 lbs.

Fig. 108½ same pulley as Fig. 108 with the exception that the sheave is 5½ inches in diameter instead of 6 inches.

Weight, dozen, 32 lbs.

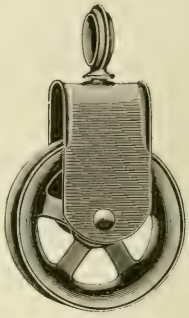


Fig. 108

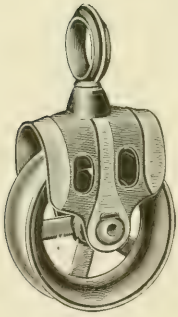


Fig. 109

ALL IRON PULLEY

Fig. 109 represents our All Iron Pulley. It has cast iron frame, with cast iron sheave 5½ inches in diameter. Frame has heavy rib to increase the strength. The sheave revolves on large hollow pin. Has swivel eye.

Weight, dozen, 38 lbs.

FLOOR PULLEY

Fig. 110 illustrates our Floor Pulley. The frame thoroughly protects the sheave. The sheave is made of hard maple. It has a hollow pin and swivel eye.

Weight, dozen, 39 lbs.

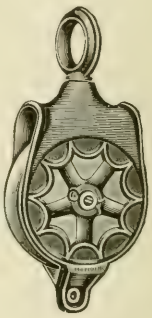


Fig. 110

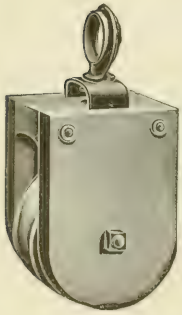


Fig. 111

WOOD FRAME PULLEYS

Reed Pattern

Fig. 111 illustrates our Wood Frame Pulley, with wrought steel yoke and malleable swivel eye. The frame and sheave are hard maple. The sheave revolves on a large bushing.

Weight, dozen, 33 lbs.

Fig. 112 represents the same construction, except that a swivel hook is used in place of the malleable eye.

Weight, dozen, 35 lbs.

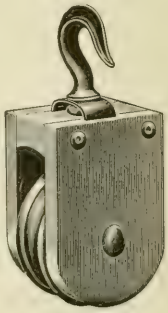


Fig. 112

Hay Fork Pulleys

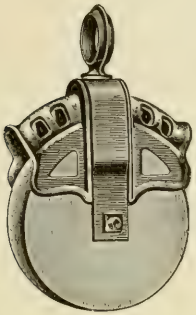


Fig. 113

SPECIAL STAR PULLEY

Fig. 113 illustrates our special STAR Pulley. It has steel yoke, malleable swivel eye, large bushing and hard maple 6-inch sheave. This pulley we recommend to dealers wanting the best. Frame constructed to prevent chafing of rope. Weight, dozen, 41 lbs.

BIG STAR PULLEY

Fig. 114 represents our Big STAR Pulley. It has hard maple sheave 7 inches in diameter. The frame is made of malleable iron, extra strong and heavy, with steel yoke, malleable swivel eye, and large bushing. Frame constructed to prevent chafing of rope. Weight, dozen, 52 lbs.

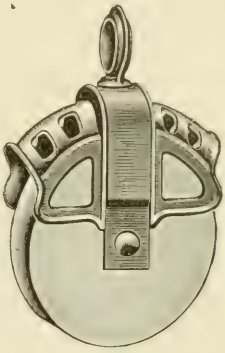


Fig. 114

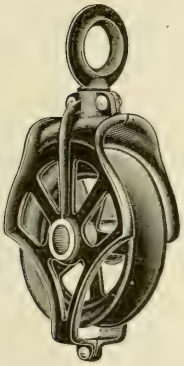


Fig. 125

MALLEABLE FRAME PULLEY
Roller Bearing

Fig. 125 illustrates our new Malleable Frame Pulley, with roller bearings. Has malleable swivel eye and 6-inch iron sheave. Made for the very best trade. Weight, dozen, 60 lbs.

MALLEABLE FRAME PULLEY
Knot-Passing

Fig. 48 illustrates our new Malleable Frame Knot-Passing Pulley, with large hollow pin. It has a hard maple sheave, 6 inches in diameter. Frame is made of malleable iron, extra strong and heavy. Has malleable swivel eye. Frame constructed to prevent chafing of rope. Weight, dozen, 40 lbs.

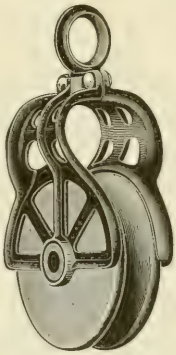


Fig. 48

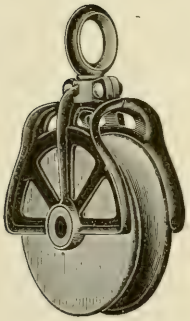


Fig. 127

MALLEABLE FRAME PULLEY
Hollow Pin

Fig. 127 illustrates our new Malleable Frame Hollow Pin Pulley. Frame constructed to prevent chafing of rope. Malleable swivel eye, 6-inch hard maple sheave. Weight, dozen, 36 lbs. We also furnish this pulley with 6-inch iron sheave, Fig. 128. Weight, dozen, 53 lbs.

PEERLESS PULLEY
Knot-Passing

Fig. 155 is designed especially to use with shift rope in connection with Nos. 575 and 576 Cross Draft Carriers, page 238, and Nos. 705 and 706, page 252, Weight, Fig. 155 Pulley, per doz., 30 lbs.

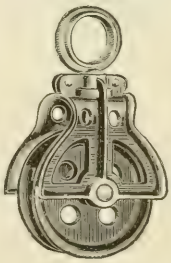


Fig. 155

Hay Fork Pulleys



Fig. 43

STEEL FRAME CABLE PULLEY

Fig. 43 represents our Steel Frame Cable Pulley which is fitted with 7-inch iron sheave adapted for $\frac{3}{8}$ or $\frac{1}{2}$-inch cable. Frame made of high carbon steel. We use a very heavy machine bolt to hold sheave in place, making an extra strong pulley. We also furnish this pulley of the same construction but fitted with roller-bearing sheave.

Weight, Steel Frame, Fig. 43, per doz., 71 lbs.



Fig. 554

GIANT WOOD FRAME PULLEY

Fig. 554 shows Giant Wood Frame Pulley, hard maple sheaves, 10 inches in diameter. The sheave of this pulley being extra large and turning on bushing $1\frac{3}{8}$ inches in diameter makes it of very light draft. The bushing fits into the bottom of the steel yoke to which is attached a large wrought iron pulley hook.

The frame is wood, made of perfect stock bolted together and braced in such a manner as to insure a pulley of great strength. Weight, Fig. 554 Pulley, per doz., 162 lbs.

WOOD FRAME CABLE PULLEY

Fig. 44 illustrates our Wood Frame Cable Pulley.

This pulley is fitted with 7-inch iron sheave. Heavy hardwood frame. This is a very substantial pulley and manufactured for heavy work.

Weight, Wood Frame, Fig. 44, per doz., 123 lbs.

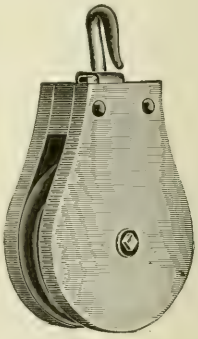


Fig. 44

Sister Hook and Clamp

Fig. 703 shows Sister Hook and Clamp, which offers a very convenient method of hanging a pulley at the end of the track.

This fixture includes a universal joint between the sister hook and clamp, allowing great flexibility and freedom of movement.



Fig. 703

The Sister Hooks are constructed of two malleable hooks which swivel on a steel bolt. They hold the pulley securely without danger of its being detached by accident, but when desired the pulley may be readily detached.

Hay Forks

Nellis Hay Fork



Fig. 94
Weight, 11 lbs.

Short Head Double Harpoon Fork

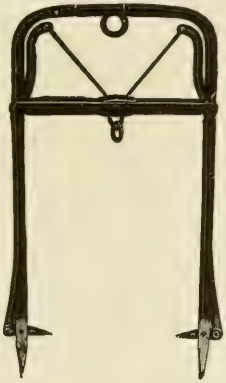


Fig. 95

Made of steel. Length of tines under cross-bar, 25 in. Weight, 16½ lbs.

Extra Long Double Harpoon Fork

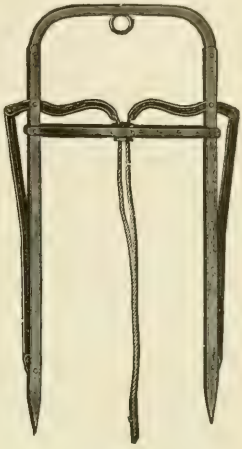


Fig. 97

Made of steel. Length of tines under the cross-bar, 31 inches. Weight, 18 lbs.

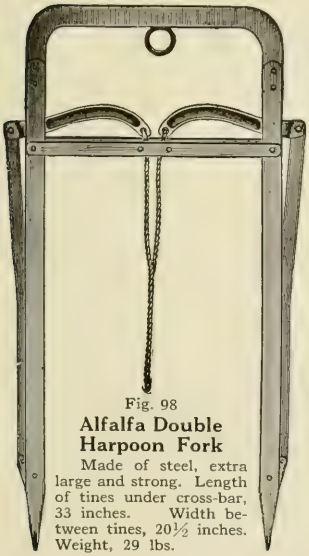


Fig. 98

Alfalfa Double Harpoon Fork

Made of steel, extra large and strong. Length of tines under cross-bar, 33 inches. Width between tines, 20½ inches. Weight, 29 lbs.

Lock-Lever Double Harpoon Fork

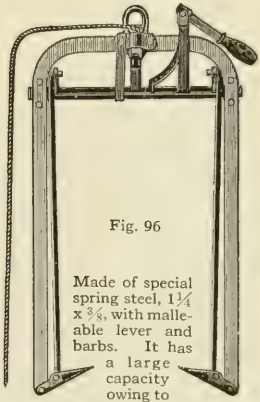


Fig. 96

Made of special spring steel, 1¼ x ¾, with malleable lever and barbs. It has a large capacity owing to the cross-bar being placed near top of fork. Length under the cross-bar, 30 inches. The special feature is that it locks open as well as closed. Weight, 25 lbs.

Grapple Hay Forks

The Automatic Safety Grapple Fork without Center Tine, especially adapted for the quick handling of loose or baled hay, fodder, etc. Constructed of high carbon spring steel.

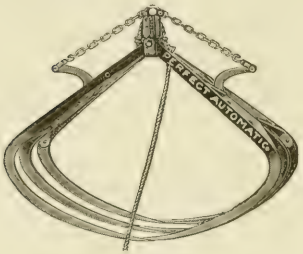


Fig. 558

Six Tine Safety Grapple Fork

Fig. 558 shows 6-tine Grapple Fork closed after it has released the load and comes back to the wagon, ready for the operator to pick it up and place it in the hay as desired.

This fork trips easily from any direction, is double braced, very strong and guaranteed.

This fork has a spread of 55 inches.

Weight, Fig. 558, 6-tine fork, each 47 lbs.

Four Tine Safety Grapple Fork

Fig. 559 shows 4-tine fork open and ready to set in hay. The pull on the trip rope releases load and the fork closes and locks automatically as shown in Fig. 558, eliminating the danger from an open fork descending to the load over the operator.

Weight, Fig. 559, 4-tine fork, each 40 lbs.

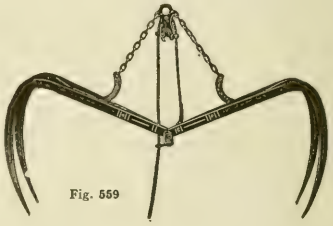


Fig. 559

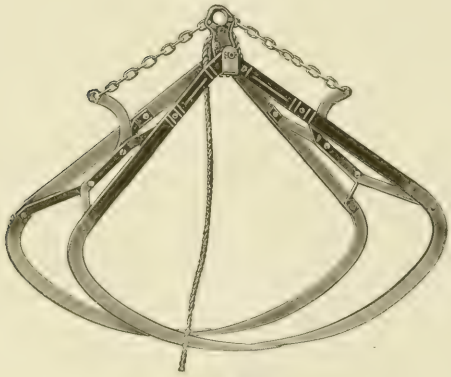


Fig. 833

Giant Safety Grapple Fork

The Giant Automatic Safety Grapple Fork is of the same general design as that shown above but is much larger, heavier and stronger. It has an extreme spread of 63 inches between the points of the tines when open and has a correspondingly greater capacity.

Weight, Fig. 833, 4-tine fork, each 48 lbs.

Weight, Fig. 834, 6-tine fork, each 56 lbs.

Hay Forks

Jackson Pattern

The greatest strength and capacity with the least amount of weight were the first objects to be secured in the construction of this fork. It is made in the following sizes:

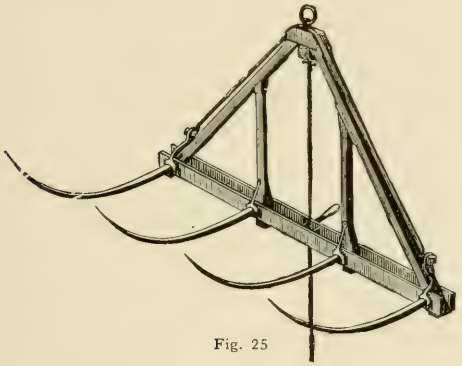


Fig. 25

3½ foot, with four tines, a light fork for hay.

4 and 4½ foot, with four tines, for threshing machines and stacking hay.

5 and 6 foot, with six tines for heading or large loads.

Made in six sizes:

3½	ft.	4 tine,	46 lbs.
4	ft.	4 tine,	47 lbs.
4½	ft.	4 tine,	55 lbs.
5	ft.	6 tine,	56 lbs.
5½	ft.	6 tine,	58 lbs.
6	ft.	6 tine,	74 lbs.

The tines are made of high grade spring steel and the material used throughout is of the very best. The trip latch is reliable. It has convenient hand-holds on the head, which are of great assistance in operating the fork. The woodwork is neatly made, all riveted and constructed so as to get the greatest possible strength. The fork is guaranteed to be strong and reliable, and is warranted to do good work.

California Pattern

Made in six sizes:

3½	ft.	4 tine,	45 lbs.
4	ft.	4 tine,	46 lbs.
4½	ft.	4 tine,	54 lbs.
5	ft.	6 tine,	55 lbs.
5½	ft.	6 tine,	57 lbs.
6	ft.	6 tine,	72 lbs.

Description same as above.

This fork has single head and the Jackson pattern has double head.

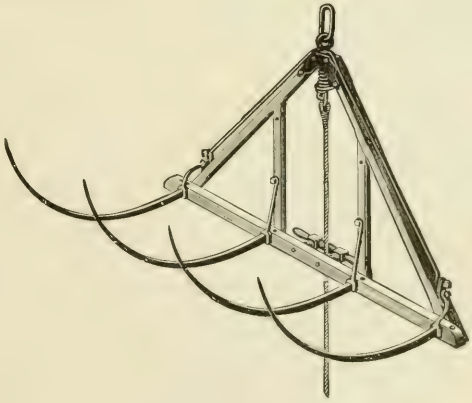


Fig. 26

Material for Hay Carrier Outfits

STEEL RAFTER GRAPPLE



Fig. 89

A very useful tool for attaching to rafters or beams. Much more convenient than trying to hang a pulley with a rope in the peak of a barn.

Weight per doz., 30 lbs.

SNATCH PULLEY BLOCK

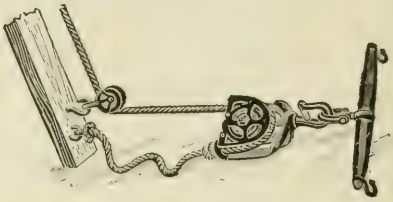


Fig. 90

The Snatch Pulley Block shortens the travel of the horse. Tie a knot in the rope and put the washer in front of it. The rope can then be thrown off the snatch pulley thus allowing the fork to be returned to the load without waiting for the return of the horse.

Weight per doz., 60 lbs.

FIXTURES FOR SUPPORTING STEEL HAY CARRIER TRACK AT END OF BARN

Weight per set, 12 lbs.

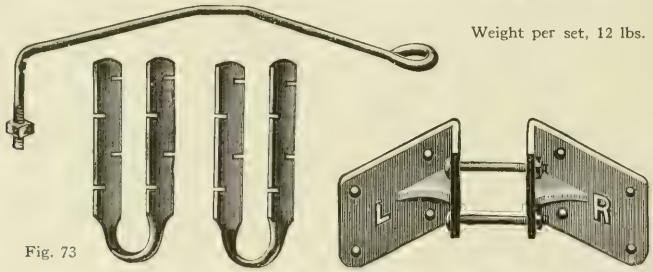


Fig. 73

Cuts Showing a Set of Fixtures for Supporting Steel Track at the End of Barn

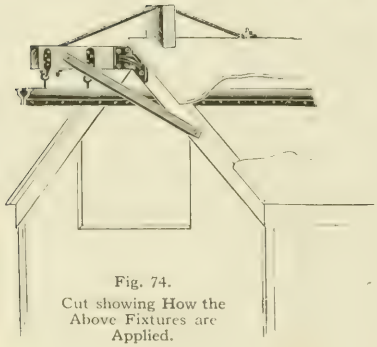


Fig. 74.
Cut showing How the Above Fixtures are Applied.

Many ways have been devised for supporting steel track at the end of barn, nearly every carpenter having a way of his own which has not always proven to be the best. It is important that the track at end of barn should be well supported because the heavy pull is at this place, and a little defect in supporting the track will cause a great deal of trouble. We show in the above cut a means of doing this, which we believe to be as good as any other, if not the best way. We are prepared to furnish the above fixtures complete and ready for use at a reasonable price.

A set consists of two heavy angle-shape castings with bolts; one bar, ½-inch round iron, 8 feet long, with eye at one end and nut at the other; two malleable ridge pole hangers.

Directions for Supporting Track at End of Barn

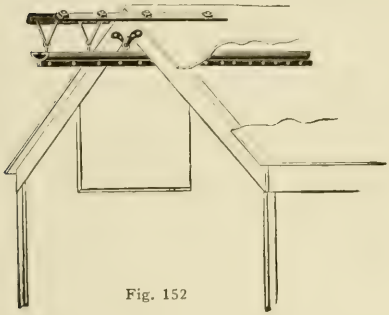


Fig. 152

Illustration showing how steel track is supported when hay is taken in at end of barn.

For directions, see page 271.

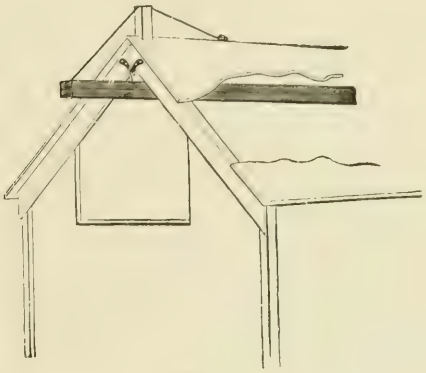


Fig. 153

Illustration showing how wood track is supported when hay is taken in at end of barn.

For directions, see page 271.



Fig. 88

V END HANGER FOR STEEL TRACK

This hanger is used to support the track when the hay is taken in at end of barn, as shown in Fig. 152.

Weight, V-End Hangers, each, 1 lb. 5 oz.

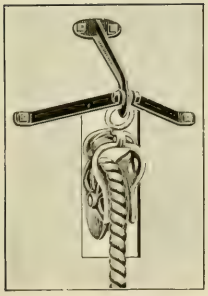


Fig. 821

STAR PULLEY BRACKET HOLDER

No. 821 STAR Pulley Bracket Holder works with any ordinary pulley.

The STAR Pulley Bracket Holder is used to support a pulley carrying the draft rope through either the side or end of the barn. It permits using the smallest possible amount of draft rope.

To attach this Pulley Bracket Holder, cut a hole in the barn siding 4 inches wide and 8 or 10 inches high. Bolt to the top of the opening. The pulley can be attached or removed from the inside or outside of barn.

This inexpensive arrangement permits a material saving of rope and reduces friction to a minimum.

Hay Carrier Returner

YOU need have no more trouble getting your carrier back to the trip block—this little machine will do it for you. As soon as the hay rope is unhooked from the whiffle-tree this machine will draw the carrier back to the trip block without any aid, and you can have your fork set by the time the horse has returned and is ready to draw up another load. No farmer can afford to do without it. It will work with any make of carrier. No weight is furnished, as it is necessary to vary this according to the length of rope used. A bag of sand will do for a weight. Complete set of directions sent with each returner.

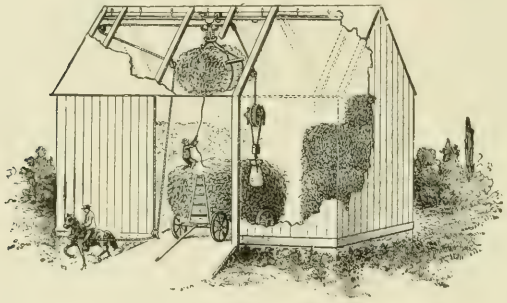


Illustration Showing Manner of Putting up Hay Carrier Returner when Hay is Taken in at the Center of the Barn.

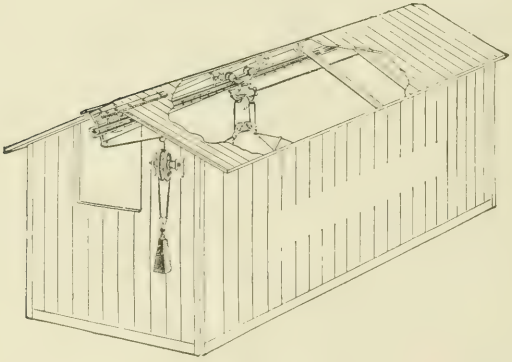


Illustration Showing Manner of Putting up the Hay Carrier Returner when Hay is Taken in at the End of the Barn.

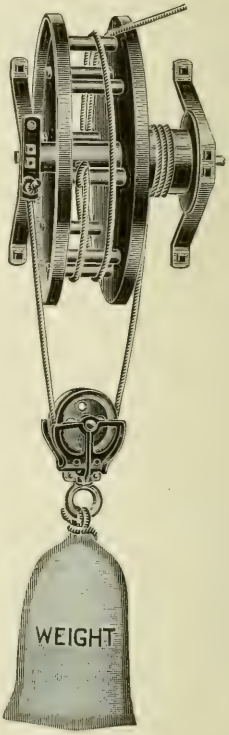


Fig. 91

Weight, each, 60 lbs.

Material for Hay Carrier Outfits

MATERIALS REQUIRED FOR STEEL TRACK CARRIERS

FOR 40-FOOT BARNS

One carrier, 36 feet of track, 19 hangers, 19 rafter brackets, 2 lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 50-FOOT BARNS

One carrier, 48 feet of track, 25 hangers, 25 rafter brackets, 2½ lbs. of bracket nails, 5 pulleys, 6 floor hooks, 1 fork.

FOR 60-FOOT BARNS

One carrier, 60 feet of track, 31 hangers, 31 rafter brackets, 3 lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 70-FOOT BARNS

One carrier, 66 feet of track, 34 hangers, 34 rafter brackets, 3½ lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 80-FOOT BARNS

One carrier, 78 feet of track, 40 hangers, 40 rafter brackets, 4 lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

MATERIALS REQUIRED FOR WOOD TRACK CARRIERS

FOR 40-FOOT BARNS

One carrier, 21 hanging hooks, 21 rafter brackets, 2 lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 50-FOOT BARNS

One carrier, 26 hanging hooks, 26 rafter brackets, 2½ lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 60-FOOT BARNS

One carrier, 31 hanging hooks, 31 rafter brackets, 3 lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 70-FOOT BARNS

One carrier, 36 hanging hooks, 36 rafter brackets, 3½ lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

FOR 80-FOOT BARNS

One carrier, 41 hanging hooks, 41 rafter brackets, 4 lbs. of bracket nails, 5 pulleys, 1 fork, 6 floor hooks.

DIRECTIONS FOR PUTTING UP WOOD TRACK AT END OF BARN

Take a bar of ½-inch round iron and make an eye at one end and thread and nut at the other end. Bend the rod over a standard (page 269) and bolt the other end through the roof of the barn.

DIRECTIONS FOR PUTTING UP STEEL TRACK AT END OF BARN

When hay is taken in at end of barn, fasten a piece of 2x6 across the rafters near the end of barn to prevent the track from working endwise, and let the other end extend out of barn. Bolt the trip block to the track over the rivet, about two feet outside of the end of the barn. Bolt two pieces 4x4 to the roof as shown (page 269) extending same about three feet from the end rafter. Place one V-shaped end hanger (Fig. 88) at the end of these pieces and the other half way between that and the end of barn.

DIRECTIONS FOR PUTTING UP WOOD TRACK

Put hangers on four rafters over the driveway and about six feet apart for the balance. Nail rafter irons on with clinch nails. See that the track is the proper depth where trip block goes on to properly operate the locks. The trip block may need blocking down from the track, or setting up into the track, according to the depth of track used. See that the nuts are all set in on the under side of track. Use ¾-inch rope, and boil and stretch it to make it soft and pliable.

DIRECTIONS FOR PUTTING UP STAR STEEL TRACK

Slip rafter brackets through hangers and nail to rafters in each end of barn and one in the center with clinch nails. Fasten a string to rafter brackets in end of barn and pass it over the one in the center; draw up tightly and fasten to the one in the other end of the barn. This will be a gauge to get the hangers all even and in line. Put hangers on to each pair of rafters through the barn. Elevate the track one section at a time and slide it on the hangers, then splice the track and be sure that the nuts are drawn up tightly on the three bolts. Fasten a piece of 2x6 across the rafters at each end of the track to prevent the track from working endwise. If a pulley changer is to be used, bolt hook No. T-5 to this 2x6 three or four inches to one side of track; but if not, use a floor hook in place of T-5 to hold the pulley. See that the bolts in the trip block are drawn up tightly. The trip block can be put on at any place where there is a rivet.

Dealer's Display Rack



The Harvester Hay Carrier Display Rack

A PRACTICAL display rack, designed for dealer's use in displaying and demonstrating Harvester Haying Tools.

A carrier so mounted and prominently displayed will attract prospective buyers of Haying Tools.

Dealers can point out to advantage and demonstrate the greater strength, weight and durability, as well as ease of operation, of these carriers.

This display rack is built of steel tubing, is 44 inches high and 48 inches wide. Furnished free (except for carrier, clamp and pulley) with an order specifying the necessary amount of Haying Tools.

Only furnished with carrier mounted. Specify type of carrier.

Weight, each 47 lbs.



STAR

Barn Door Hangers

Cannon Ball Door Hangers and Track

THE Cannon Ball Door Hanger is the most widely sold hanger in America. Being known from coast to coast, and having been used for years, its heavy sales speak volumes for the merit of the article.

"Cannon Ball Door Hangers" are the standard by which all others are judged. They represent the height of perfection in design, construction and operation.

Special designed steel ball wheels—light running, and with a wide tread, are mounted on a strong steel truss frame. The frame, with wheels, runs completely enclosed in a tubular track —nothing exposed.

Cannon Ball Door Hangers are built tandem or single wheel type, flexible, frictionless, noiseless, and constructed with long roller bearings.

They are adjustable or non-adjustable as may be required. The adjustable type ensures an easy operating door at all times. If door swells or warps, by adjusting a screw it is moved away from the building, preventing any friction or binding. If the floor swells, the door can be raised to clear the obstruction by means of the adjusting nut.

The non-adjustable hanger represents a type that has been on the market for years. It is built most substantially, only the best of materials being used. The hangers of this type will operate for years and give the best of service.

These tandem hangers were designed for use with heavy doors and operate successfully under all conditions.

Cannon Ball Track is the result of years of experience. It represents the highest point of development in the manufacture of door tracks.



No. 384 Cannon Ball Tandem Door Hanger

Non-Adjustable

THE Cannon Ball Door Hanger shown opposite is of the tandem type. Two special designed steel ball wheels, light running and noiseless, are mounted on a strong steel frame. Each wheel revolves on ten cold rolled steel roller bearings, making the hanger absolutely frictionless. The frame with the wheels runs completely enclosed in Cannon Ball Tubular Track—nothing is exposed to the wind or weather. The door strap is connected to this strong, steel frame by a malleable bracket or stirrup. This hanger is non-adjustable and is especially adapted for use with heavy doors.

Packed one pair in a box; six pairs in a carton. Weight per dozen pairs, 68 lbs.

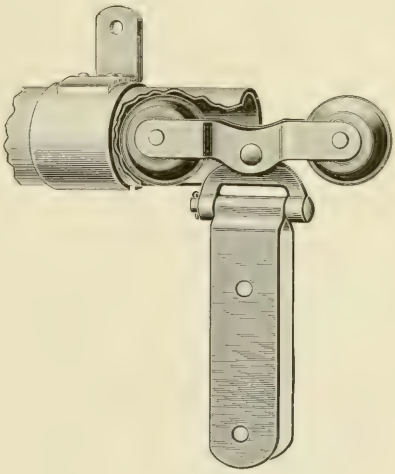


Fig. 384



No. 440 Cannon Ball Tandem Door Hanger

Lateral and Vertical Adjustments

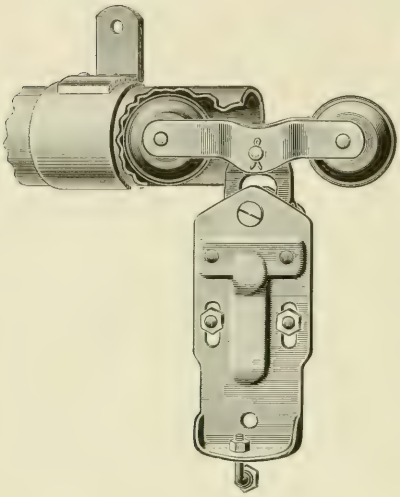


Fig. 440

FIGURE 440 illustrates another type of Cannon Ball Tandem Door Hanger. Two special designed steel ball wheels, revolving on ten cold rolled steel roller bearings, are supported by a strong steel frame. The frame and wheels operate in Cannon Ball Tubular Track—nothing exposed to the weather. A connecting stirrup of the very best malleable iron supports the door strap. This door strap of high carbon steel is so designed that the door can be set closer to the building, or farther away, as desired, by means of an adjusting screw at the top of the strap. The door may also be raised or lowered as may be required by turning a nut at the bottom of the strap. This strap is designed for doors of any thickness. By using this hanger, doors that have swelled or warped, can be operated as easily as a new door just put up. This hanger, being of the tandem type, is designed especially for heavy doors.

Packed one pair in box; six pairs in carton. Weight, per dozen pairs, 84 lbs.

Dealer's Display Model

DISPLAY and demonstrate Cannon Ball Hangers and Track and easy sales will be the result. We furnish a neatly finished model, as illustrated, suitable for counter or window display. We also include a very attractive display card, advertising the exclusive features of Cannon Ball Hangers.

We charge regular prices only for the pair of hangers and the brackets.

This model equipped with the style of hanger you are handling, should be included with the next order.

Weight, each, 27 lbs.



Fig. 792

No. 507 Cannon Ball Tandem Door Hanger

Lateral and Vertical Adjustments

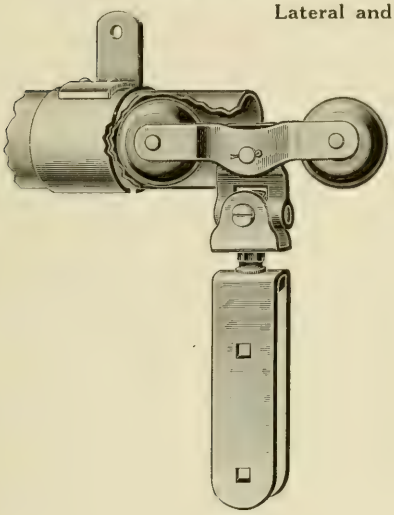


Fig. 507

THE hanger illustrated in Fig. 507 is a Tandem Cannon Ball Hanger having both lateral and vertical adjustments. Two steel ball wheels of special design are mounted on a strong steel frame. Each wheel revolves on ten cold rolled steel roller bearings, making them frictionless and noiseless.

The frame and the wheels are completely enclosed in Cannon Ball Track—nothing is exposed to rain or snow or other damaging elements so that the hanger operates easily, smoothly and perfectly at all times.

The steel door strap is connected to the frame by a stirrup of malleable iron. By turning the set-screw at the top of the strap, the door can be moved closer to the building or farther away as desired. By turning to right or left the nut which sets on top of the door strap, the door may be raised or lowered as may be required.

The No. 507 is a hanger that works perfectly in all kinds of weather and which will operate equally well on swelled and warped doors.

Packed one pair in a box; six pairs in a carton.

Weight per dozen pairs, 84 lbs.



Mr. J. C. Beard's Star Equipped Barn at Decorah, Iowa

No. 387 Cannon Ball Tubular Track

3-Foot Lengths

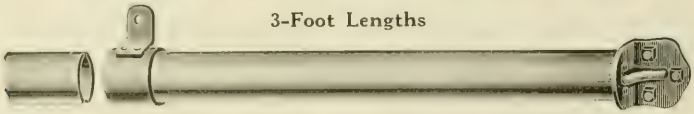


Fig. 387



Fig. 388
Crate of Cannon Ball Track
Convenient -Compact May Be Stored Under Counter

CANNON Ball Track is recognized as the most popular tubular track on the market. Its reputation has placed it on the shelves of practically every dealer in the United States and Canada. This track is constructed of 14 gauge, special analysis steel. It is formed under a process which combines the strength of material with the strength of design. Its construction provides greater strength and less friction. Being tubular in shape, the hangers operating inside of it are completely enclosed. This construction permits the hangers to operate noiselessly and without friction. Cannon Ball Track is not only bird-proof but also weather-proof and its shape makes it self-cleaning.

Center Brackets, Figure 682, and End Brackets, Figure 680, shown on opposite page, are used in connection with this track.

Cannon Ball Tubular Track is built in 3-foot sections and is regularly packed 96 feet to the crate. Weight per crate of 96 feet, 205 lbs.

Detachable Cannon Ball Track Cover

3-Foot Lengths

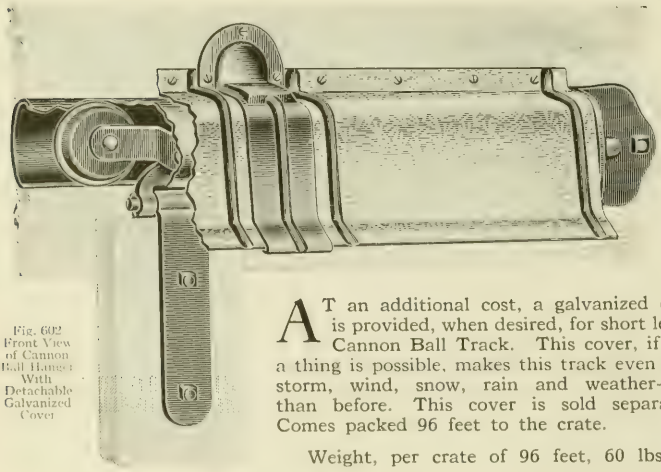


Fig. 602
Front View of Cannon Ball Hanger With Detachable Galvanized Cover

AT an additional cost, a galvanized cover is provided, when desired, for short length Cannon Ball Track. This cover, if such a thing is possible, makes this track even more storm, wind, snow, rain and weather-proof than before. This cover is sold separately. Comes packed 96 feet to the crate.

Weight, per crate of 96 feet, 60 lbs.

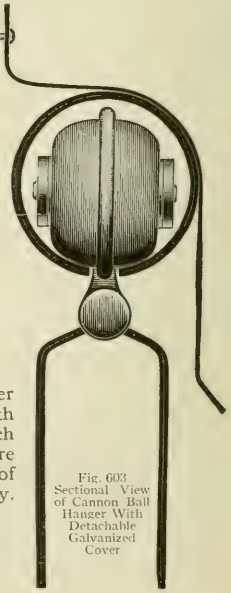


Fig. 603
Sectional View of Cannon Ball Hanger With Detachable Galvanized Cover

No. 681 Cannon Ball Tubular Track

Long Lengths

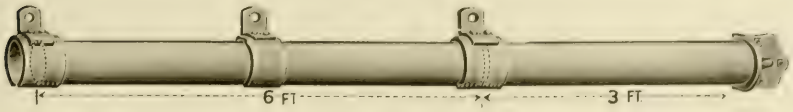


Fig. 681

To supply the demand for longer lengths, Cannon Ball Track is made in 4, 6 and 8 ft. sections.

Aside from the difference in length, the track shown above is exactly like that shown on the opposite page. These lengths in combination with the regular 3-foot sections will accommodate any width door. Cannon Ball Track in longer lengths than 3-foot is packed 100 feet to the crate, assorted as follows: three 4-foot, four 6-foot and eight 8-foot sections. Weight per crate, 215 lbs.

Cannon Ball Track Brackets



Fig. 682
Center Track Bracket



Fig. 683
Intermediate Track Bracket



Fig. 680
End Track Bracket

The Cannon Ball Track Brackets shown herewith are used to complete the simple installation of No. 387 Cannon Ball Track in 3-foot lengths shown on the opposite page and the No. 681 Cannon Ball Track in long lengths illustrated above.

Cannon Ball Center Bracket, Fig. 682, is required to join sections of Cannon Ball Tubular Track the two rivets shown connect the two sections of the bracket and also extend down so as to engage the slots at the ends of the rail sections, preventing them from turning.

Cannon Ball Intermediate Track Bracket, Fig. 683, is used to support sections of Cannon Ball Tubular Track longer than 3-feet. These Intermediate Track Brackets differ only from the Center Track Brackets in that they can be slid along the rail as desired, whereas the Center Track Brackets connect and support only the ends of the sections.

Cannon Ball End Track Bracket, Fig. 680, is required to close up and support the ends of the track.

The Cannon Ball Center and Intermediate Track Brackets are packed two dozen to the crate. Weight per crate, 23 lbs.

The Cannon Ball End Track Brackets are packed one dozen to the crate. Weight per crate, 8 lbs.

No. 651 Covered Cannon Ball Door Track

(Illustrated in Connection with the No. 440 Adjustable Cannon Ball Hanger)

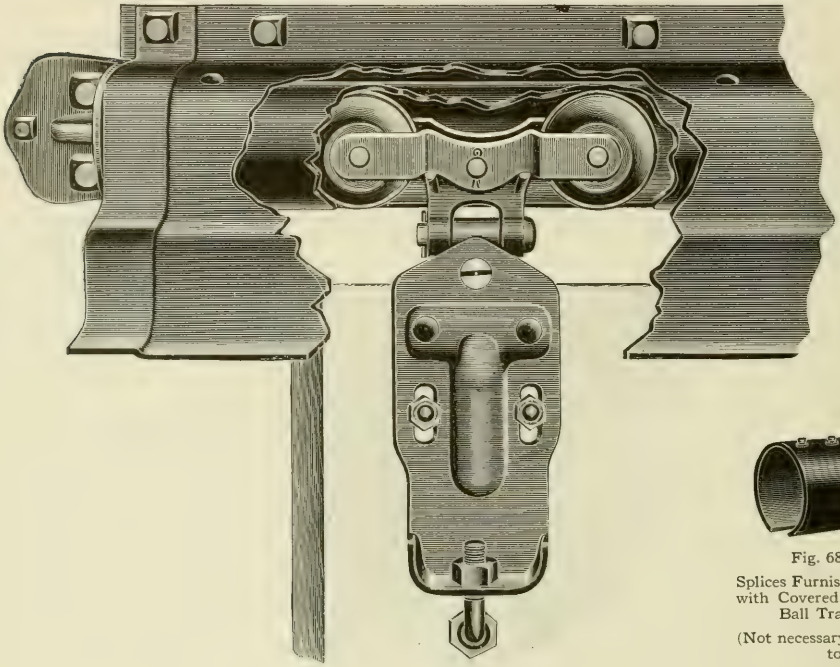


Fig. 685
Splices Furnished Free with Covered Cannon Ball Track
(Not necessary to specify)

Fig. 651

THE Covered Cannon Ball Track illustrated above combines all the advantages of the Standard Cannon Ball Track shown on the preceding pages. To this, add the advantage of a deep cover, which is riveted (not welded) to the track itself.

This cover is sufficient in depth so that it not merely sheds those rains which descend gently, but the cover comes clear down below the top of the door as shown in the illustration.

By countersinking the stirrup of the hanger, the door can be brought still higher so that the door is enclosed in a manner which makes it practically weather-tight.

This cover not only gives the greatest possible measure of protection as indicated above, but acts as a support for

No. 651 Covered Cannon Ball Door Track

(Continued)

the track, doing away with brackets.

Any of the Cannon Ball Hangers shown on pages 275, 276 and 277 can be used in connection with this Covered Cannon Ball Track.

Covered Cannon Ball Track is furnished in four, six and eight-foot lengths. Four pieces of one length are packed in a crate. Weight of track, four and one-half pounds per foot.

End Track Brackets are the same as those used with regular Cannon Ball Track and are packed in crates of one and two dozen each. Weight per dozen, 9 lbs.

Cannon Ball and Covered Cannon Ball Track

THE special advantage of using the weatherproof cover supplied with Covered Cannon Ball Track is in the protection afforded where the track is actually above the door opening. The rest of the track may be regular Cannon Ball—without the cover.

The splice shown in Fig. 685 on the opposite page makes a neat, smooth connection between the Covered Cannon Ball Track and that which is built without the cover.

By using the Covered Cannon Ball Track immediately above the door opening and Cannon Ball without the cover for the balance of the track, quite a saving is effected.

Combination of Regular and Covered Track

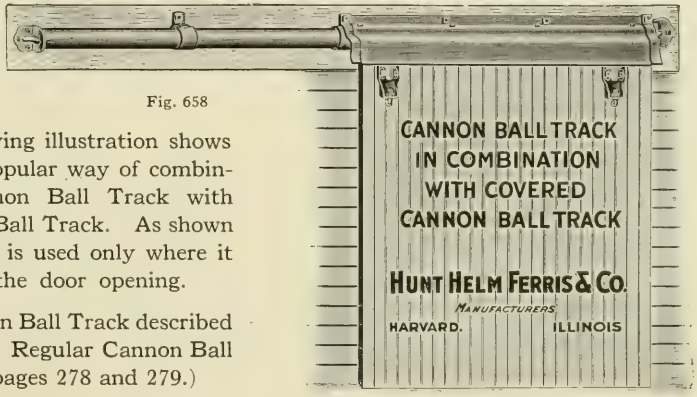


Fig. 658

The accompanying illustration shows a practical and popular way of combining regular Cannon Ball Track with Covered Cannon Ball Track. As shown the covered track is used only where it is required over the door opening.

(Covered Cannon Ball Track described on opposite page. Regular Cannon Ball Track shown on pages 278 and 279.)

Weatherproof Cannon Ball Barn Door Track and Hangers

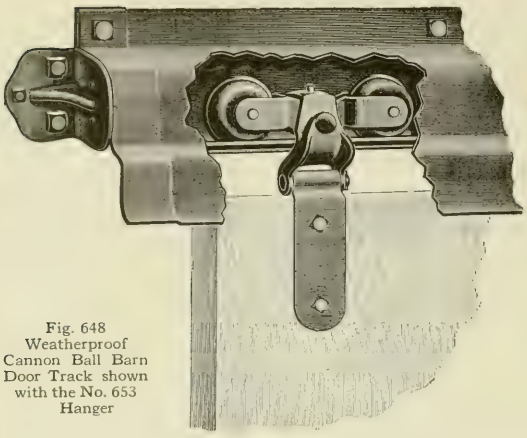


Fig. 648
Weatherproof Cannon Ball Barn Door Track shown with the No. 653 Hanger

IN the Weatherproof Cannon Ball Barn Door Track the top of the hood is turned in toward the building and clamped to it. The lower edge of the hood is bent out, forming a long deflector which throws the rain away from the building.

The hood comes well down below the top of the door, preventing rain or wind from entering over the door. The hood or shield carries no weight whatsoever—it is a weather protection pure and simple.

Weatherproof Cannon Ball Track itself is of much heavier construction than the hood, being made of 14-gauge steel, strong and heavy enough to meet every requirement. Both track and hood are held in place by the same bolts which also support the track brackets.

No. 653 Weatherproof Cannon Ball Hanger

In Fig. 647 is shown the No. 653 Cannon Ball door hanger in connection with the track. A picture of the same hanger alone is shown in Fig. 653. Weight per dozen pairs, 74 lbs.

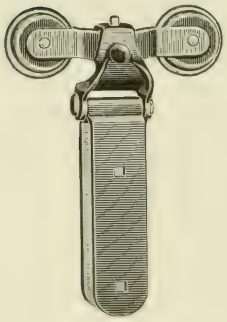


Fig. 653

No. 661 Adjustable Weatherproof Cannon Ball Hanger

The hanger shown at the right is similar in construction to the hanger shown at the left and other illustrations on this and the opposite pages. The difference is that it is fitted with an adjustable strap which permits the door to be raised or lowered—or set closer or farther from the barn—after the door is hung.

Weight per dozen pairs, 96 lbs.

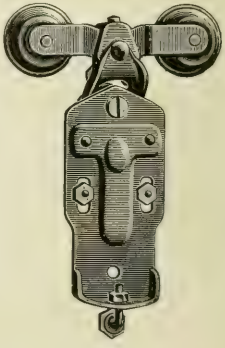
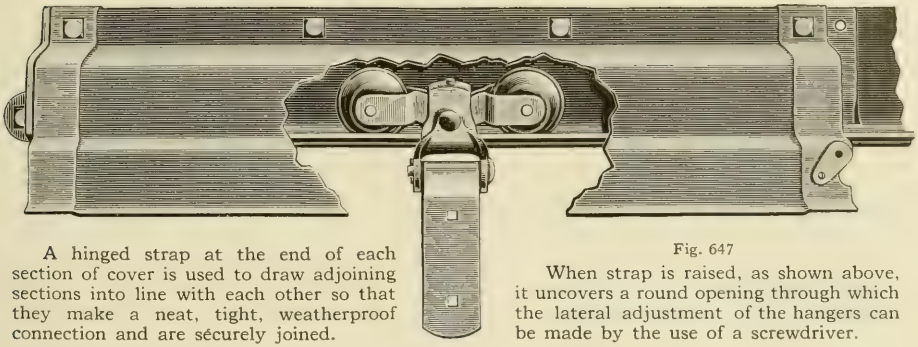


Fig. 661

No. 647 Weatherproof Cannon Ball Barn Door Track



A hinged strap at the end of each section of cover is used to draw adjoining sections into line with each other so that they make a neat, tight, weatherproof connection and are sécurely joined.

Fig. 647

When strap is raised, as shown above, it uncovers a round opening through which the lateral adjustment of the hangers can be made by the use of a screwdriver.

IN Figure 658 is shown a sectional view of Weatherproof Cannon Ball Track and Hanger. This illustration clearly shows the extra deep cover or hood, with which the track is provided. It also shows how the track conforms exactly to the shape of the steel ball wheel, giving the wheel an even bearing on both sides.

This illustration also shows the shape of the stirrup, which conforms to the shape of the track and prevents the hanger from jumping off.

The track and cover being independent of each other, the track is put up before the cover is applied. Nail holes are provided along the upper edge so that the track can be set in place, properly alligned and securely fastened before the cover is bolted on.

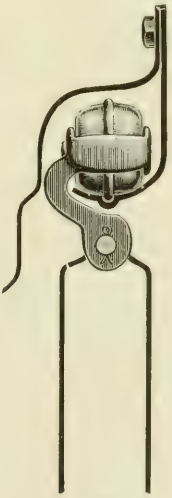


Fig. 658

Sectional View of Weatherproof Cannon Ball Track and Hanger

Center Track Brackets

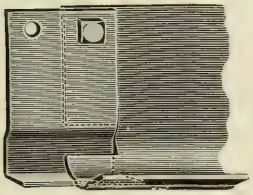


Fig. 656

IN Figure 656 at the left is shown the Center Track Bracket or Splice, by means of which two sections of track are accurately lined up where they connect, making a smooth joint.

This track is furnished in 4, 6 and 8-foot lengths, and is packed in crates of 52 feet, made up of two 4-foot, two 6-foot and four 8-foot lengths. Weight of track, per foot, 3¼ lbs.

Enough Center Track Brackets to install the track are included in each crate of track. End Track Brackets packed in crates of one dozen each. Weight of brackets, per dozen, 7 lbs.

No. 845 Weatherproof Tandem Door Hanger

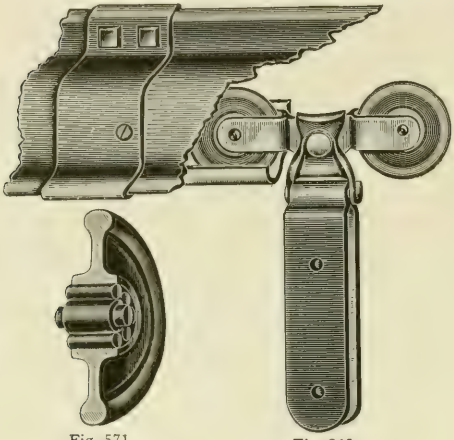


Fig. 571
Sectional View of Wheel
Showing Roller Bearings

Fig. 845

THE Weatherproof Tandem Door Hanger shown in Fig. 845 at the left is practically noiseless and frictionless. The toughness of steel with the desirable qualities of iron, have been combined in the construction of the wheels. They are roller bearing, as indicated in Fig. 571, and run in a roomy groove. The tandem truck holds the wheels in alignment and prevents them from sticking or binding.

Packed one pair in a box; six pairs in a carton. Weight per dozen pairs, 85 lbs. See opposite page for description of track.

No. 846 Weatherproof Tandem Door Hanger

Lateral and Vertical Adjustments

IN Fig. 846 at the right is shown the Weatherproof Tandem Door Hanger, which combines all the desirable features of the No. 845 hanger shown above in addition to the adjustable features.

The door strap of high carbon steel is so designed that by turning the screw in the top of it, the door can be placed closer to the building or set farther away from it.

By loosening the two nuts at either side of the strap, the height of the door may be adjusted by turning the nut at the bottom of the strap.

By using this hanger, doors that have swelled or warped can be operated as easily as a new door.

Packed one pair in a box; six pairs in a carton. Weight per dozen pairs, 107 lbs.

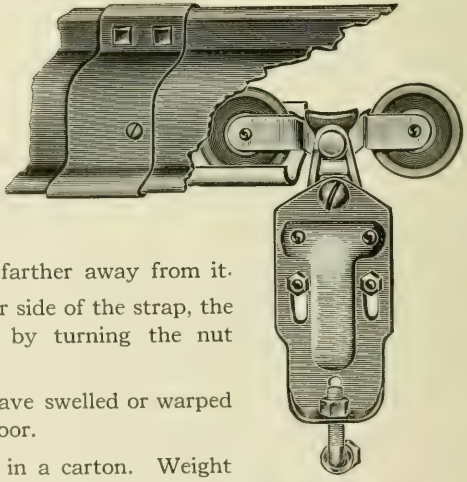


Fig. 846

No. 847 Weatherproof Barn Door Track

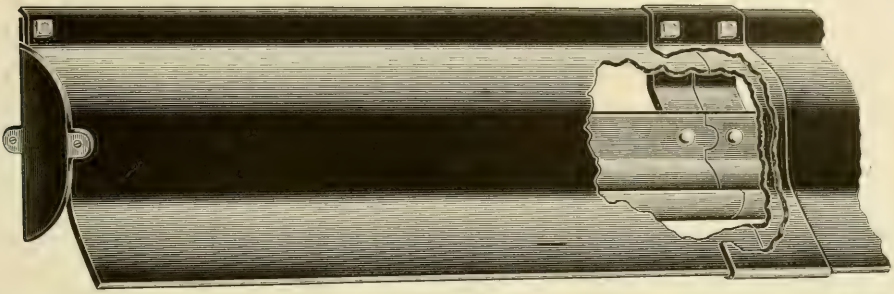


Fig. 847

THIS new Weatherproof Barn Door Track is all that its name implies. The deep cover affords a shelter that protects the track, brackets and hangers from the ravages of rust, and more important still—it comes down below the top of the door and keeps rain, sleet and snow from blowing into the barn.

Easiest Track to Install

No directions are needed. There is nothing to figure out. You can't put it up wrong. Track, brackets, cover and cover splices are all riveted together, making a one-piece track. You can start at either end. Lag screw one piece to the barn, add the other sections, hang your door, put on your end stops and the job is done.

And that's all you will ever have to do, because both track and hangers are virtually trouble-proof.

The cover cannot sag and rub on the hangers. Neither can it lose its shape, and the weatherproof feature that the shape gives it; it has no weight to hold up, the track being independently supported by good, strong brackets, as shown in both pictures on this page.

The illustrations also show how the heavy track is firmly riveted to these sturdy brackets. There is no danger of the track being torn loose from its fastenings.

The sectional view at the right shows that the hanger has plenty of clearance and the groove in which the wheels operate is large enough to give the wheels ample room to run without sticking or binding.

The track can't be thrown out of line at the joints because—as shown in the cut-away view above—the lip or projection from the end of one piece of track fits accurately into a corresponding notch in the end of the next section. This automatically lines up the track. It makes an even joint so that the operation of the hanger is perfectly smooth.

Track comes in 4 ft., 6 ft. and 8 ft. lengths. It is packed in crates of 52 ft., consisting of two 4 ft., two 6 ft. and four 8 ft. sections. Weight of track per foot, 2¼ lbs. End track brackets packed with hangers.

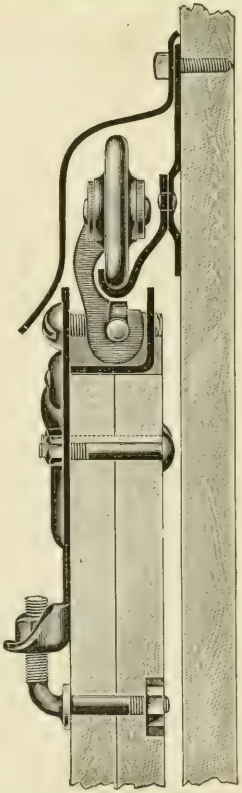


Fig. 848
Sectional View

No. 28 Twentieth Century Door Hanger

Roller Bearing, for Round Track

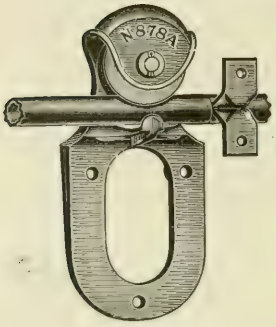


Fig. 35
Rear View

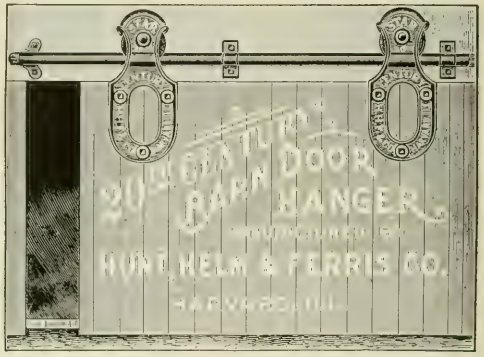




Fig. 28
Front View



Fig. 29
Sectional View

THERE always has and probably always will exist a demand for a strictly A No. 1 round track door hanger.

The Twentieth Century Barn Door Hanger has proven itself a decided improvement, both in style and construction, on all other hangers of this class.

Both frame and hood of the hanger are one malleable piece. This makes it strong enough for the largest doors.

The wheels have wide grooves and run on hardened steel roller bearings which, of course, reduce friction to a minimum.

A projecting lip below the wheel makes it impossible to jump the track.

The hanger, running on round track, possesses about the same amount of flexibility as ordinary hinge or flexible types.

Finish is battleship gray enamel and red. Hangers packed one pair in a box with bolts and brackets—six pairs to wooden case.

Weight, per dozen pairs, 74 lbs.

No. 30 Twentieth Century Door Track

Made in Two-foot Sections Only

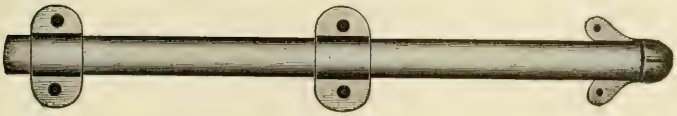


Fig. 30

THE fact that Twentieth Century Barn Door Track is made in two-foot sections gives it five distinct advantages over ordinary round track. Here they are—

1. Easier to erect. You don't have to juggle ten-foot sections in the air.

2. Bracket turns on splice so rail cannot warp.

3. Any width of door can be fitted with the necessary length of track. Carpenter doesn't have to find different length of track for different doors.

4. Dealer at all times has complete stock of track as it is only necessary for him to carry one length. This can easily be stored under counter if desired.

5. The track is closed—the only round track that IS—consequently no water can get in to rust it away.

We positively guarantee that this track is as strong at the splice as at any other point and stiff enough to sustain the heaviest door.

The splice is exactly the same diameter as the track and forms a continuous and smooth passage for the hanger.

All track crated 100 feet to crate, finished in battleship gray enamel; diameter 1⅛ inches; weight per 100 feet, 120 lbs.

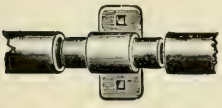


Fig. 82. Splice



Fig. 42. End Bracket



Fig. 49. Section Track Bracket



Fig. 140
Crate Containing 100 feet

No. 397 Flexo Door Hanger

Roller Bearing—Hinge Type

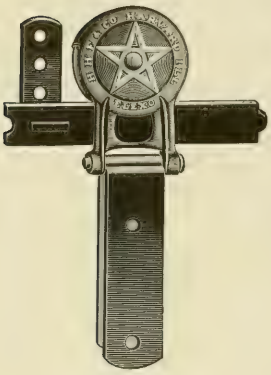


Fig. 397
Front View

THE FLEXO HANGER, as the name suggests, meets every demand for a practical hinge hanger to operate on flat track. This hanger is flexible and hinged to the door so it can be pushed out at the bottom, as illustrated in Fig. 399, if desired. This hanger cannot jump the track nor get out of order.

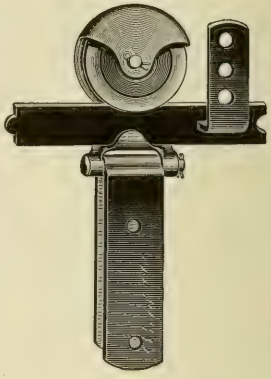


Fig. 398
Back View

The Flexo Hanger is neat in design and nicely finished in gray enamel, trimmed with red. It is roller bearing and fitted with a double steel door strap attached. The removable steel pin, secured by a cotter, permits attaching the door strap to the hanger after it has been secured to the door.

One pair of hangers, complete with bolts, packed in a pasteboard box, one dozen pairs to wooden case.

Weight, per dozen pairs, 64 lbs.

No. 160 Flexo Door Track used with Flexo Door Hangers, is made of high carbon steel, $\frac{3}{16}$ x $1\frac{1}{4}$ in., furnished in 6, 8 and 10 ft. lengths.

Weight, per 100 ft., 105 lbs.

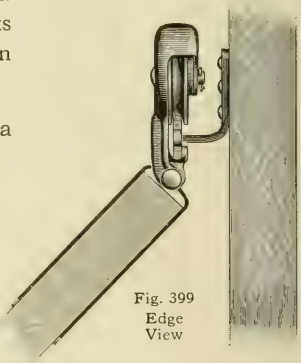


Fig. 399
Edge
View

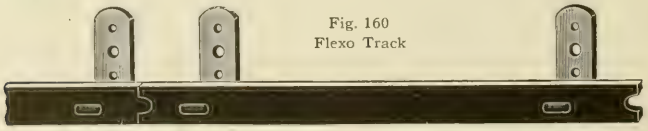
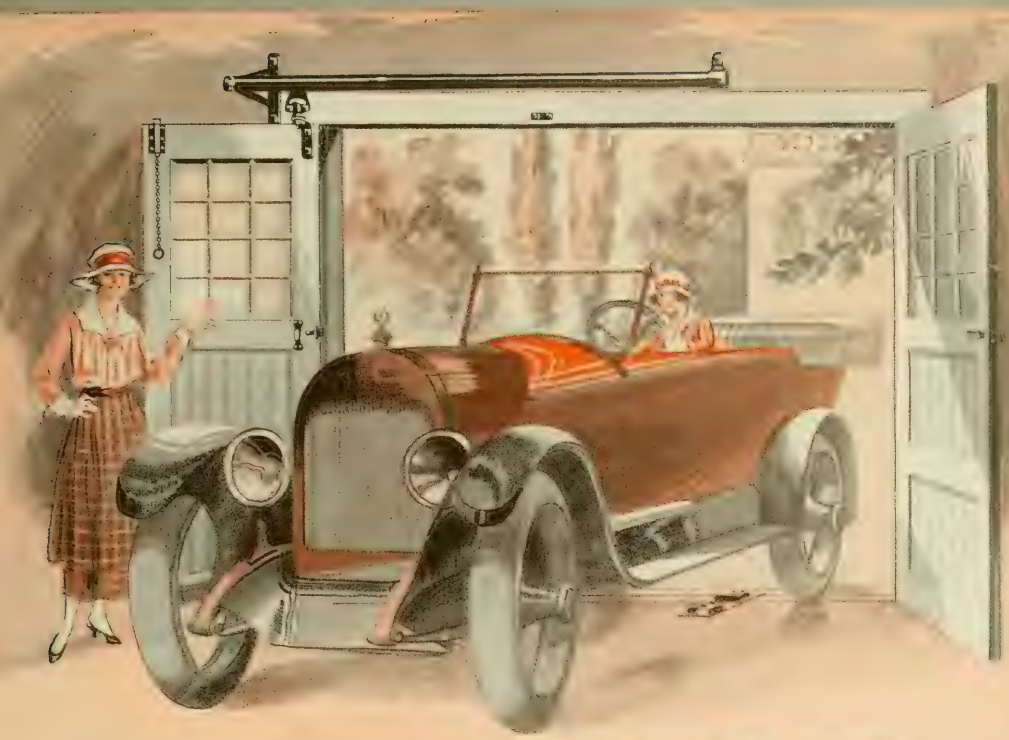


Fig. 160
Flexo Track



STAR
Garage Door Hangers

No. 800 Cannon Ball Combination Garage Door Set

(Folding-Sliding)

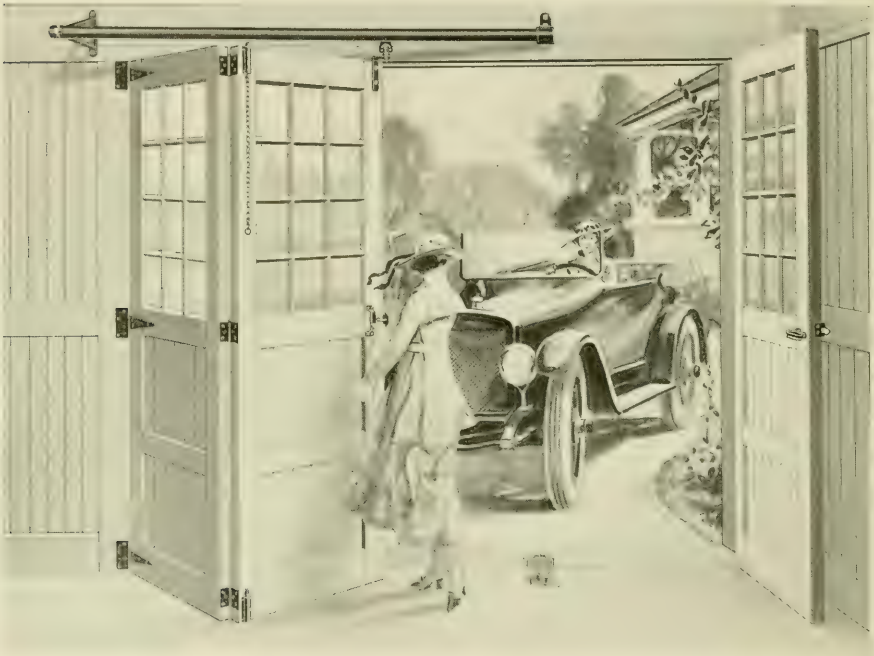


Fig. 785

THE Cannon Ball Combination (Folding-Sliding) Garage Door Set, neat and efficient, has been especially designed for use on all types of garages. By the use of regular Cannon Ball Track and specially designed Cannon Ball Hangers we have devised a complete garage outfit which will fit a door opening of any size up to 8½ feet. The same outfit can be furnished for wider doors on special order. Like other Cannon Ball Hangers and Track, this garage door hanging is frictionless and noiseless and operates most easily. When the folding-sliding doors are opened they are automatically held in place by the patented spring bracket which supports the end of the track. This spring device operates regardless of the thickness of the doors. An adjustment on the hanger prevents the doors sagging. As the folding-sliding doors fold inside, they take up a minimum amount of space and operate in a small circumference. If it is undesirable to operate the whole front, a convenient entrance is obtained by means of a single swinging door. By the use of this outfit the opening is made weather tight. These sets are packed complete, ready to install.

No. 800 Cannon Ball Combination Garage Door Set

(Folding-Sliding—Continued)

IN Fig. 787 is illustrated the inside of a garage with the doors closed and the complete Cannon Ball Combination Garage Set in view. Note how perfectly the doors fit the opening, making it weather-tight. The door to the right swings independently of the other two, permitting an easy entrance to or exit from the garage—a great convenience at all times, especially in cold weather. The two spring door bolts, one located at the top, the other at the bottom, at the center of the folding-sliding doors, lock them securely and keep the entrance weather-tight.

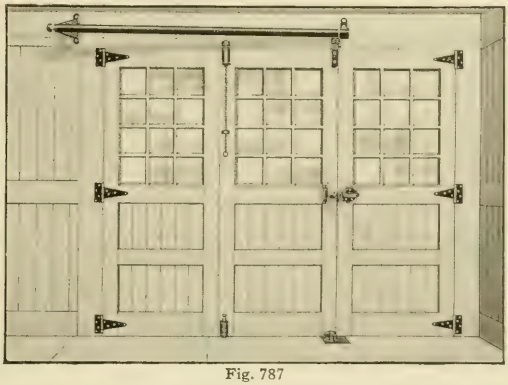


Fig. 787

FIGURE 786 shows the inside of a garage with all the doors open. Note that the private entrance door swings back against the wall at the right. Also that the two folding-sliding doors on the left roll back on our special Garage Hanger running in Cannon Ball Track, and fold against the wall, where they lie flat, occupying only the space required by their own thickness.

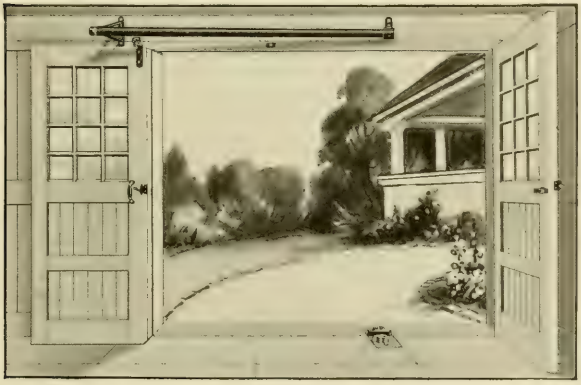


Fig. 786

They are held in this position by our patented Spring Bracket which supports the track at the end, as shown in the illustration.

When the doors are folded back against the wall, the spring in the bracket holds them securely, regardless of their thickness.

No. 800 Cannon Ball Combination Garage Door Set

(Folding-Sliding—Continued)

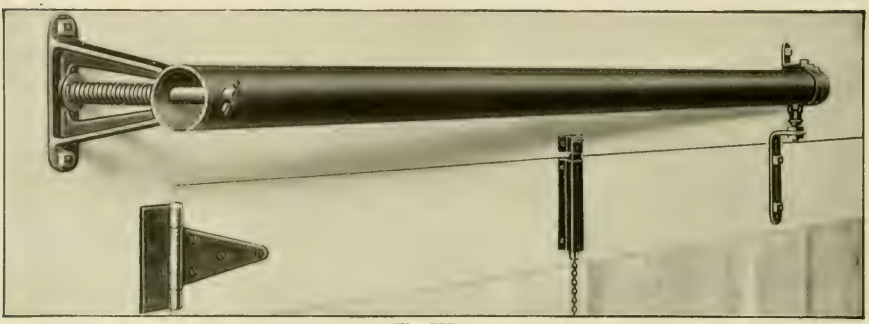


Fig. 788

FIGURE 788 shows the Cannon Ball Spring Track support attached to the end of the track at the left. The Track is supported at the opposite end by a track bracket that swivels. When the Folding-Sliding Doors are opened, the track adjusts itself to allow the doors to swing around and lie flat against the wall.

The spring in the supporting bracket holds the doors securely against the wall, regardless of their thickness.

The doors can be closed by simply giving them a slight pull they almost close themselves.

Dealers' Display Outfit

DISPLAY this model on your counter, or in your show window. Demonstrate to contractors and builders of garages the only perfect Combination Garage Door Set. A neatly printed placard is included with each model, stating twelve big talking points that are bound to convince. Include one of these models with your next order for Cannon Ball Hangers.

Weight, each, 24 lbs.

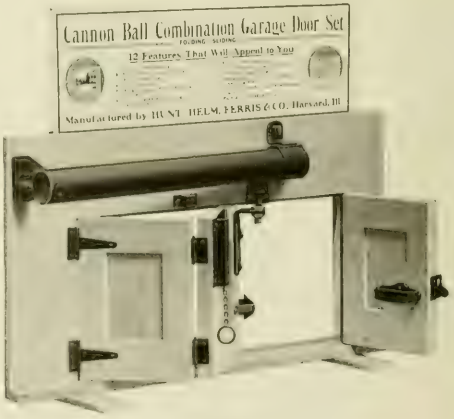


Fig. 790

No. 800 Cannon Ball Combination Garage Door Set

(Folding-Sliding—Continued)

FIGURE 800 shows one complete garage set.

This set contains:

1 6½-foot length of Cannon Ball Track.
1 Cannon Ball Swivel Bracket.
1 Floor Guide.
1 Hand Pull.
1 Specially designed Tandem Cannon Ball Hanger.
6 "T" Hinges.
3 Butt Hinges.
1 set Chain and Foot Bolts.
1 Spring Supporting Bracket for Cannon Ball Track.
1 Cannon Ball Door Latch.

The necessary screws, lags and bolts are included for installation.

A complete set, ready to be installed.

Weight, per set, 35 lbs.

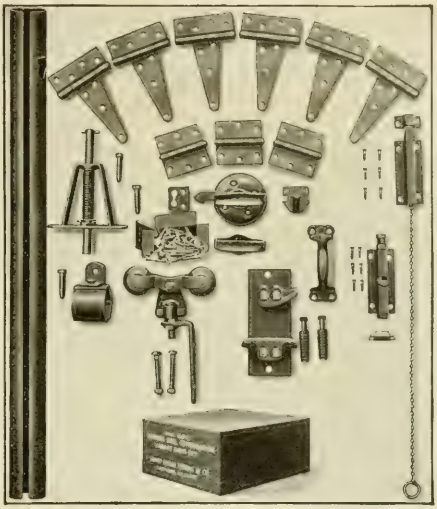


Fig. 800

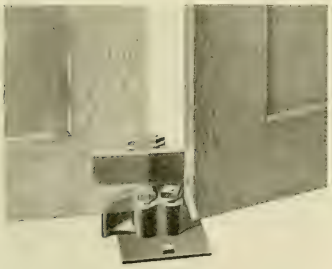


Fig. 789

FLOOR GUIDE FOR CANNON BALL COMBINATION GARAGE DOOR SET

FIGURE 789 shows the operation of the floor guide used in connection with the Cannon Ball Combination Garage set. The folding-sliding doors glide into it easily, and will hold firmly in place when once closed. The swinging door slides into place and when these doors are locked, the floor guide prevents any play. It holds the doors firmly.

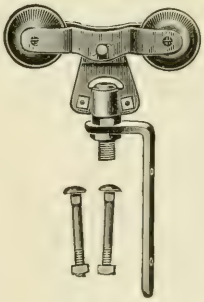


Fig. 802

SPECIAL GARAGE HANGER

FIGURE 802 illustrates the Special Garage Hanger used in the Cannon Ball Combination Garage Door Set. This hanger is of the tandem type, each wheel revolving on ten cold rolled steel roller bearings. This hanger swivels, permitting an easy operation of the doors. It is an adjustable hanger, a feature which permits the doors to operate if they are warped, or if the floor is swelled. One hanger packed in a Cannon Ball Combination Garage Door Set.

No. 900 Flexo Folding-Sliding Garage Door Set

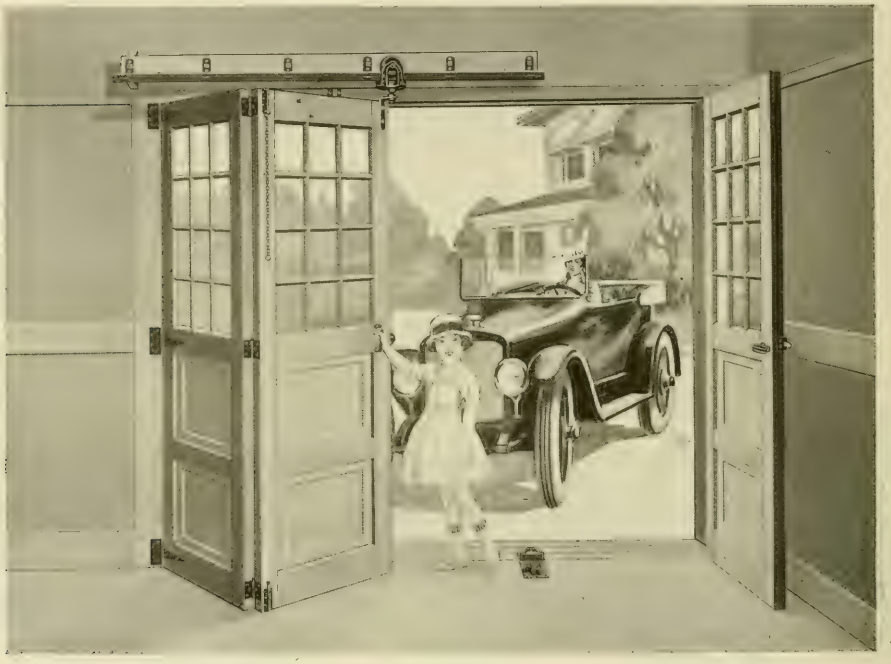


Fig. 985

THE above illustration pictures the practicability of the No. 900 Flexo Folding-Sliding Garage Set. Note that the service door swings back against the wall at the right, also that the two folding-sliding doors on the left roll back on our special Garage Hanger. These doors fold back against the wall where they lie flat, occupying only the space required by their own thickness. See Fig. 886 on opposite page. The end of the track being blocked out, holds the door securely back against the wall.

The distinctive features of the No. 900 Flexo Folding-Sliding Garage Door Set which will appeal to you, are

1. Fits any opening.
2. Easy to install.
3. Adjustable Hanger to take care of sagging.
4. A weather-proof entrance.
5. Doors fold inside, occupying minimum space.
6. Neat in appearance and efficient in service.

No. 900 Flexo Folding-Sliding Garage Door Set

(Continued)

THE Flexo Folding-Sliding Garage Door Set, Fig. 900, includes sufficient items for one complete Garage outfit. The set contains one length of track, one floor guide, one specially designed Garage Hanger, one-half dozen "T" hinges, three butts, one pair chain and foot bolts and one Cannon Ball Door Latch. One hand pull. The necessary screws and bolts are included. The weight of the complete set, including a 6½-foot section of track, is 35 lbs.

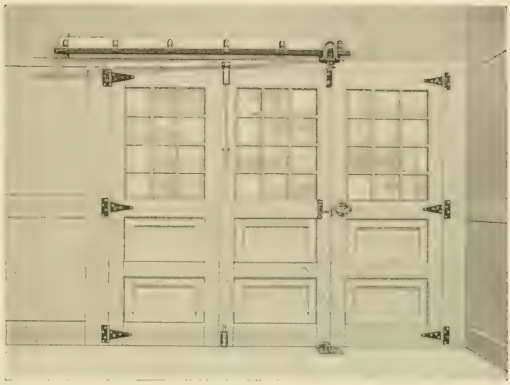


Fig. 887

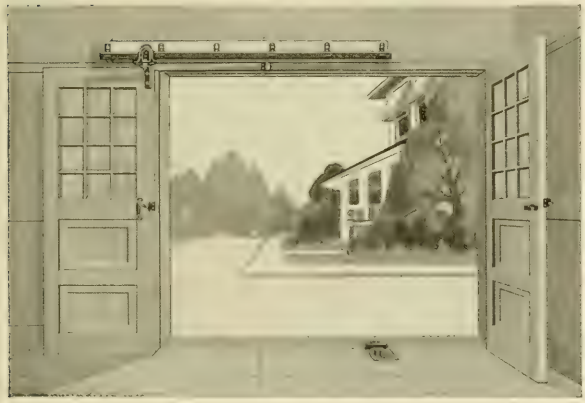


Fig. 886

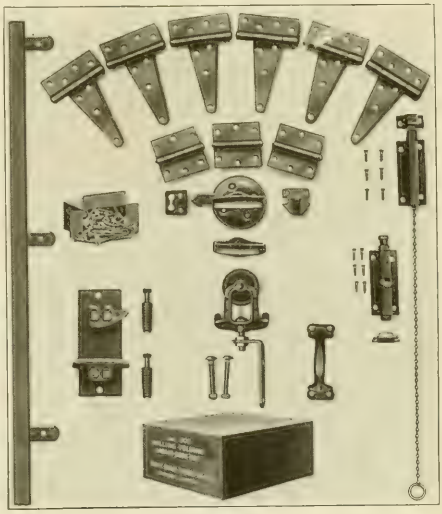


Fig. 900

Illustration Fig. 887 shows a view taken inside of a Garage with the doors equipped with the No. 900 Flexo Folding-Sliding Garage Door Set. Note how perfectly the doors fit the opening, making it weather-tight. The door to the right swings independently, permitting an easy entrance to or exit from the Garage without disturbing the other doors—a great convenience at all times, especially in cold weather. The two spring door bolts, one located at the top and the other at the bottom, at the center of the folding-sliding doors, lock them securely and keep the entrance weather-tight.

Cannon Ball Garage Door Hangers

For Use with Cannon Ball Curve and Right Angle Installations, Described on the Following Pages



Fig. 715
Weight per dozen pairs, 56 lbs.
Used in installations shown
on pages 298 and 299

THE old, reliable Cannon Ball Hanger built with special straps and swivelling arrangement.

The Straps are adjustable to fit a door of any thickness and are also reversible, allowing attachment at either right or left end of the door.

The swivelling arrangement is necessary in order that the hangers will operate in the curve or right angle.

Figure 715 illustrates the Single - Wheel Non - adjustable Cannon Ball Garage Swivel Hanger for use in connection with Cannon Ball Curve.

Figure 734 illustrates the Single-Wheel Adjustable Cannon Ball Garage Swivel Hanger for use in connection with Cannon Ball Curve.

Figure 735 illustrates the Two-Wheel Non-adjustable Cannon Ball Garage Swivel Hanger for use in connection with the Cannon Ball Right Angle.

Figure 736 illustrates the Two-Wheel Adjustable Cannon Ball Garage Swivel Hanger for use in connection with Cannon Ball Right Angle.



Fig. 734
Weight per dozen pairs, 67 lbs.
Used in installations shown
on pages 298 and 299

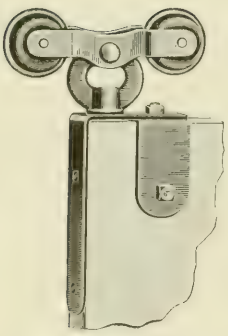


Fig. 735
Weight per dozen pairs, 76 lbs.
Used in installation shown
on page 297

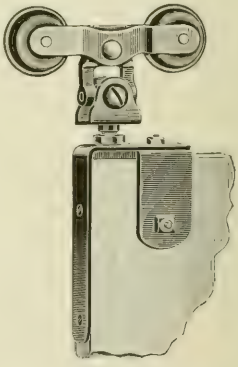


Fig. 736
Weight per dozen pairs, 89 lbs.
Used in installation shown
on page 297

Cannon Ball Right Angle Installation

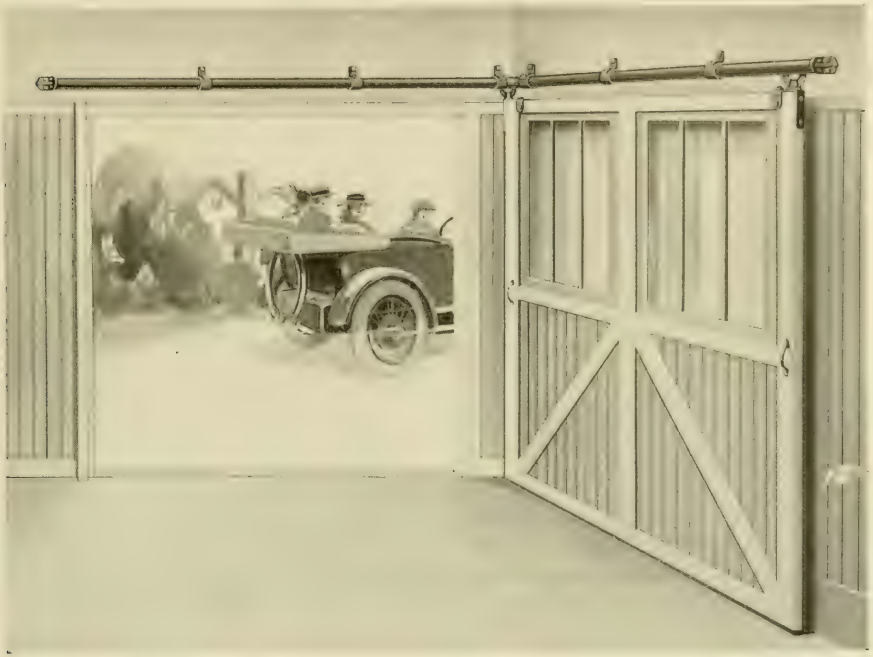


Fig. 737

ONE of the general types of garages for which garage equipment must be furnished, is where the opening is placed to the extreme side of the front of the garage. The accompanying illustration shows how in such a case, the door can be installed by the use of a Cannon Ball Right Angle in connection with Cannon Ball Track and Brackets (see pages 278 and 279).

The Cannon Ball Right Angle consists of two 3-foot lengths of track, cut out, intercrossed and gas-welded, forming a right angle. Each arm of the right angle is 3 feet in length; is notched on the end, as is a regular piece of Cannon Ball Track, so that it can be joined to Cannon Ball Track by the use of Cannon Ball Center Brackets.

Two runs of track are installed and joined by the Cannon Ball Right Angle. With this arrangement, Cannon Ball Tandem Garage Hangers, Nos. 735 or 736, page 296, are used.

A Single Door should have two handles set a foot from each end of the door.

For an installation where the Cannon Ball Right Angle is used, the following material is necessary:

FOR ONE 8-FOOT DOOR

1-12 dozen pair No. 735 or No. 736 Cannon Ball Garage Hangers.
12 feet Fig. 387 Cannon Ball Track.
One only Fig. 716 Cannon Ball Right Angle.
1-3 dozen Fig. 682 Cannon Ball Center Brackets.
1-6 dozen Fig. 680 Cannon Ball End Brackets.

Note that this takes care of the type of garage where the Cannon Ball Track Curve cannot be used, for lack of space. If the garage is too short to permit the use of an 8-foot door, two 4-foot doors can easily be installed, but such installations require careful fitting.

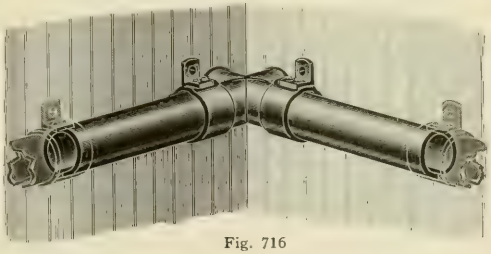


Fig. 716

The No. 716 Cannon Ball Right Angle for use with Cannon Ball Track and Brackets. Weight, each, 15 lbs. Two supporting brackets are furnished as shown in the illustration.

Cannon Ball Curve Installation



Fig. 775

BY the arrangement of Cannon Ball Track as shown in the accompanying illustration, rolling doors can be used where the opening is nearly as wide as the building itself.

When hung in this manner the doors remain inside the building where they are not subject to damage by wind or accident, and when open lie back against the wall where they occupy only the space required by their own thickness.

To arrange Cannon Ball Track as shown in Fig. 775, Cannon Ball Track Curve Fig. 712 is used.

The Cannon Ball Track Curve is a curved length of standard Cannon Ball Track. It fits into brackets like the straight lengths. A special support riveted to the top of the curve and fastened to a brace as shown, keeps the curve from twisting or sagging. The center radius of the curve is twelve inches. The distance from the middle of the track bracket, joining the curve and the straight track, to the corner is 14½ inches. The opening should be started at least 15 inches from the corner, so that the door hangers rest in the straight track when the door is closed.

Cannon Ball Single Wheel Garage Swivel Hangers, as shown in Fig. 715 and Fig. 734, page 296, are used in connection with the track curve.

A handle should be attached to each of the outer sections of the three-section door, one foot from the outer edge of each. A third handle should be located in the middle of the center section.

Equipment necessary for complete installation where Cannon Ball Curve is used:

FOR ONE 3 SECTION, 8-FOOT DOOR

1-6 dozen pair No. 715 or No. 734 Cannon Ball Garage Hangers.

18 feet Fig. 387 Cannon Ball Track.

1 only Fig. 712 Cannon Ball Curve.

½ dozen Fig. 682 Cannon Ball Center Brackets.

1-6 dozen Fig. 680 Cannon Ball End Brackets.

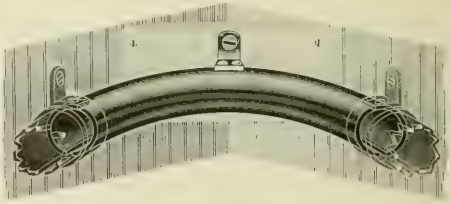


Fig. 712

The No. 712 Cannon Ball Track Curve for use with Fig. 387 Cannon Ball Track, Brackets, etc. Weight, each, 4 lbs.

Cannon Ball Curve Installation

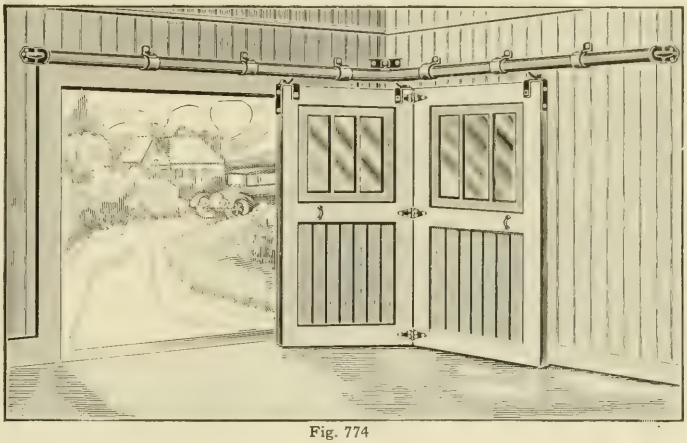


Fig. 774

IN Fig. 774 is illustrated the two-door installation for use with the Cannon Ball Curve. These two doors may be hinged in the middle, and by using the No. 715 or No. 734 Cannon Ball Garage Swivel Hangers, illustrated on page 296, they may be operated easily and successfully. Two door pulls as shown in the illustration, should be located at least six inches from outside edge of each door. These doors, when open, lie against the side wall and occupy only the space required by their own thickness. They are much more convenient than a single door as they require less space in turning the corner. Regular Cannon Ball Track, Fig. 387, Center Brackets, Fig. 682, and End Brackets, Fig. 680, are used, together with a regular Cannon Ball Curve as shown in Fig. 712 on the preceding page.

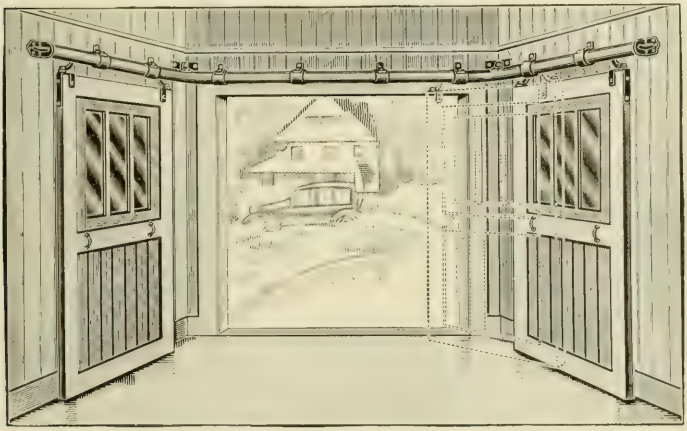


Fig. 773

FIGURE 773 shows the inside arrangement of a garage where two four-foot doors meeting in the center are used to close an eight-foot door opening. Fig. 712 Cannon Ball Track Curve is used in connection with Fig. 387 Cannon Ball Track, Fig. 382 Cannon Ball Center Brackets and Fig. 680 Cannon Ball End Brackets.

When two four-foot doors are used, each should have a handle set six inches from the outside edge.

Equipment necessary: 1-6 doz. pair No. 715 or No. 734 Cannon Ball Garage Hangers. 21 feet Fig. 387 Cannon Ball Track. 2 only Fig. 712 Cannon Ball Curve. 2⅔ doz. Fig. 682 Cannon Ball Center Brackets. 1-6 doz. Fig. 680 Cannon Ball End Brackets.

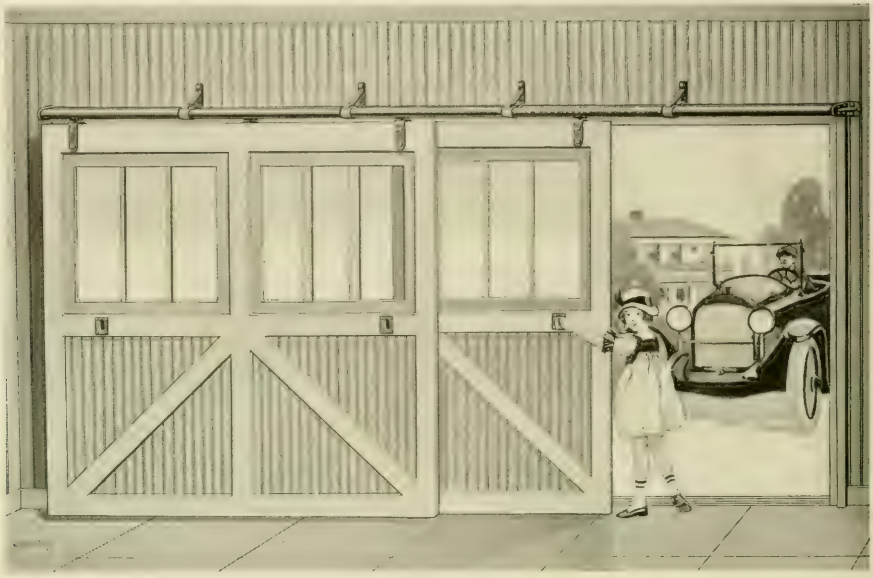


Fig. 776

Cannon Ball Parallel-Track Installation

THE Cannon Ball Parallel-Track Installation is shown in the above illustration. Note that two runs of Fig. 387 Cannon Ball Tubular Track are supported by Fig. 696 Cannon Ball Parallel Center Brackets. Cannon Ball Door Hangers as illustrated on pages 275, 276 or 277 are used.

This installation is adapted for permitting one series of Doors to operate in connection with another series of doors on an adjoining track. This arrangement permits the doors to pass or repass each other so that two doors or two series of doors occupy no greater space than one, if desired.

Fig. 861 shows a cross section of two doors and the two tracks running parallel, which instantly conveys the practicability of this arrangement where it is desirable to use doors to close a wider opening than a single door would occupy.

Brackets for supporting runs of Cannon Ball Track installed parallel, are fitted with two sleeves of 12-gauge material riveted to a triangular brace made of 3-16 x 1½ inch steel. The rivets project $\frac{3}{8}$ of an inch on the inside of the track, engaging the slots in the ends of the track sections, preventing them from turning, thus keeping the track in perfect alignment.

Parallel Cannon Ball Center or Intermediate brackets, weight per dozen, 30 lbs.
Parallel Cannon Ball End Brackets, weight per dozen, 12 lbs.

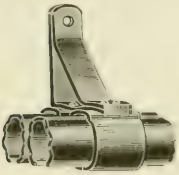


Fig. 803
Cannon Ball Parallel
Intermediate Bracket



Fig. 698
Cannon Ball Parallel
End Bracket

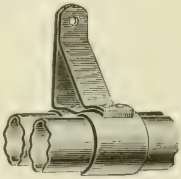


Fig. 696
Cannon Ball Parallel
Center Bracket

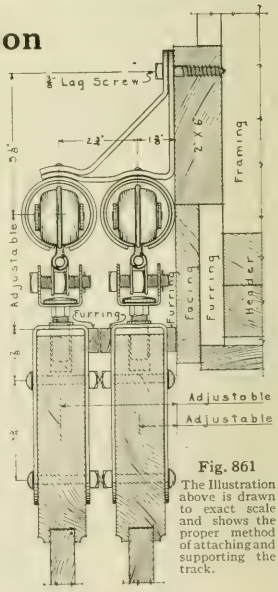


Fig. 861
The Illustration above is drawn to exact scale and shows the proper method of attaching and supporting the track.



Fig. 780

Cannon Ball Straight-Track Installation

REGULAR Cannon Ball Track Fig. 387, Center Brackets Fig. 682 and End Brackets Fig. 680 are used in the installation shown in the above illustration. This installation is used where a door is hung on the inside of a garage sufficiently wide to permit the door sliding back as illustrated in Fig. 780. Any one of the Cannon Ball Hangers illustrated and described on pages 275, 276 or 277 may be used in this installation, but we suggest the use of No. 440 Cannon Ball Tandem Door Hanger illustrated herewith. This has proven most satisfactory. A complete description of Cannon Ball Track and Brackets may be found on pages 278 and 279.

Fig. 440 illustrates Cannon Ball Tandem Barn Door Hanger for installations as shown above. For description see page 276.

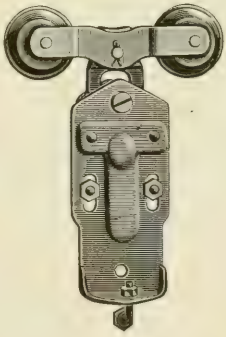


Fig. 440

Barn Door Stay Rollers

No. 174 HARVARD STAY ROLLER

STEEL frame with gray iron wheel, as shown in Figure 174. Easily and quickly adjusted. Cannot roll over or get away from the door. Japan finish. Packed one-half dozen in pasteboard box.

Weight, per dozen, 11 pounds.

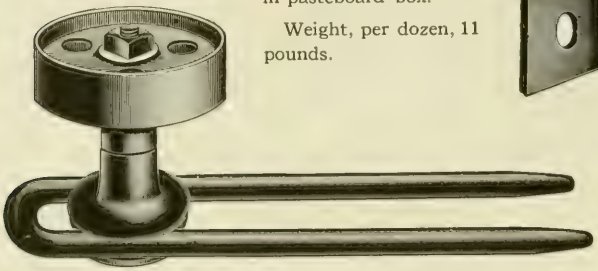


Fig. 174

No. 176 PERFECTION STAY ROLLER

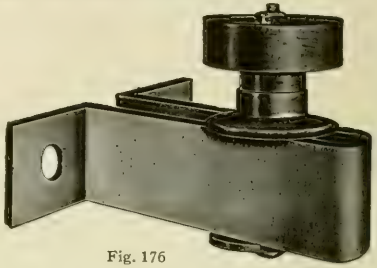


Fig. 176

The frame of Fig. 176 is made of heavy steel and the adjusting parts of iron. Cannot turn over sideways or get away from the door.

Japan finish, packed one dozen in a box.

Weight, per dozen, 12 pounds.

No. 173 STANDARD STAY ROLLER

Made of steel with gimlet point thread and gray iron wheel. Illustrated in Fig. 173. Japan finish. Weight, per dozen, 7 pounds.

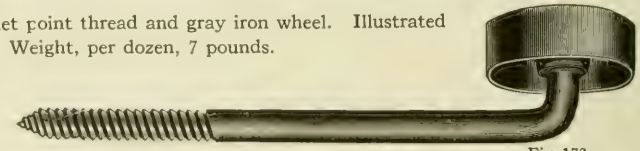


Fig. 173

No. 172 STAR STAY ROLLER (ADJUSTABLE)

Fig. 172 illustrates the STAR Door Stay Roller. It will pay you to look at its design carefully. Positively cannot roll over sideways or bend away from the door.

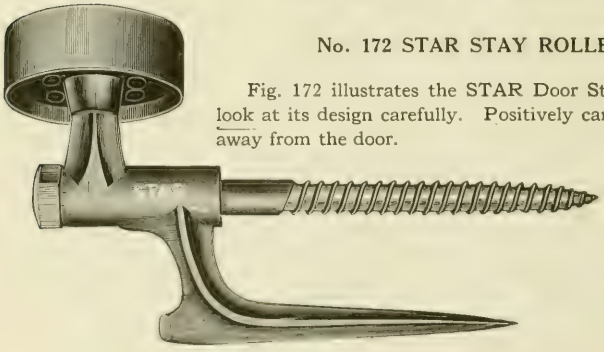


Fig. 172

Spike is made of best malleable iron. Lag screw is put in to hold it in place.

Japan finish. Packed one dozen in pasteboard box.

Weight, per dozen, 11 pounds.

Barn Door Stay Rollers

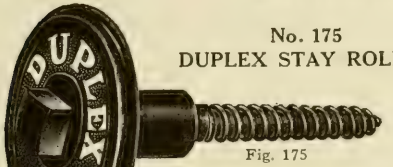


Fig. 175

No. 175
DUPLEX STAY ROLLER

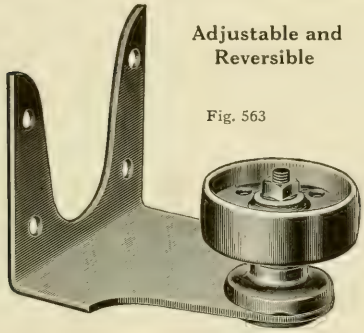
THE principal points of the roller illustrated in Fig. 175 are strength and neatness.

Lag screw is 5 x ½ inches and wheel is made of gray iron.

Packed one dozen to the pasteboard box.

Weight, per dozen, 11 lbs.

No. 563 UNIVERSAL STAY ROLLER



Adjustable and Reversible

Fig. 563

FIGURE 563 shows the Universal Stay Roller in position where it is desired to attach it to the barn. Note extra wide space between screw holes, giving added strength and rigidity.

The Universal Stay Roller is reversible, thus allowing roller being used where it is desirable to set the legs in cement floor or driveway. This would be necessary in case of a cement or stone barn. The end of the plate to which the wheel is attached is slotted. This makes the roller adjustable to doors of different widths.

Packed ½ dozen in pasteboard box and 3 dozen in wooden box for shipping. Japan finish.

Weight, per dozen, 11 pounds.

No. 754
THE GIANT STAR STAY ROLLER

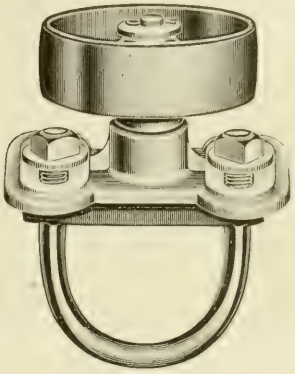


Fig. 754

A Stay Roller That Is a Giant in Strength

THE Giant STAR Stay Roller was designed on account of the great demand for a large, heavy, stay roller for cement. It is made of the very best iron throughout. The wheel is 3½ inches in diameter, having an inch and a quarter face. The complete roller is 6 inches in height. The bottom loop or template is firmly imbedded in the cement. The stay roller being separate, it can be attached by the two bolts and nuts as shown in the illustration, after the cement has hardened around the template. The roller is adjustable to doors of different thicknesses by means of the two bolts as shown in the illustration. Finished in black japan. Packed loose. Weight, each, 3 lbs.

No. 694 Cannon Ball Door Latch

For Swinging or Sliding Doors

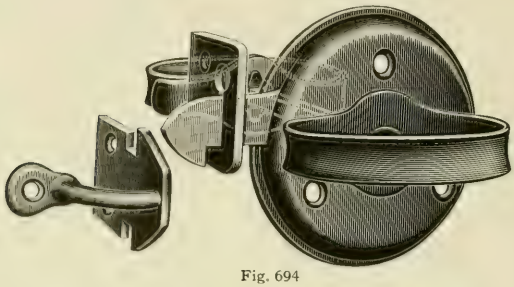


Fig. 694

The Cannon Ball Door Latch illustrated in Fig. 694 may be used on any door whether it slides or swings, and whether it opens to the right or left. It latches automatically, being controlled by a single, simple spring, which makes its operation quick and sure.

The latch guard is so designed that it cannot be opened by accident, although it can be easily opened by a turn of the handle from either inside or outside.

A padlock may be hooked into a hole above the latch bolt, locking the door.

The latch plate, handles, and all exposed parts are so shaped and protected that they will not catch on harness or other passing objects.

This latch is designed to fit doors of any thickness up to two and one-half inches.

Finished in black japan, thoroughly baked on at a high temperature.

Each latch packed separately in cardboard cartons. Weight, per one-half dozen, 8 lbs.

No. 793 Cannon Ball Door Stop

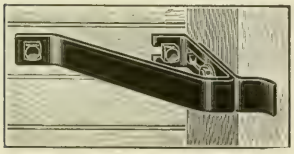


Fig. 793

THE Cannon Ball Door Stop illustrated in Fig. 793 is constructed of special high carbon steel. It is firmly braced, and when attached to the side of the building, offers a perfect and substantial bumper for the door. Adjustable to doors of different thicknesses. It is finished in black Japan. Packed one dozen in box. Weight, per dozen, 9 lbs.

No. 177 Star Gravity Barn Door Catch

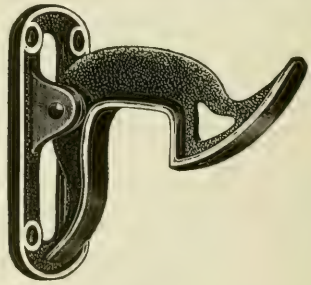


Fig. 177

Fastened to the side of the building, this device automatically catches the door and holds it open.

Packed one dozen in a box.

Weight, per dozen, 6 lbs.

No. 823 Star Outside Door Latch

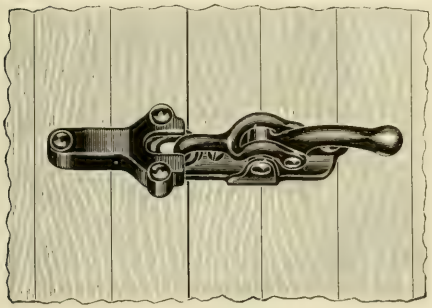


Fig. 823

THE STAR Door Latch, as shown in Fig. 823 at the left, is used outside to draw a pair of sliding doors together, making the connection tight and stormproof.

The hook or catch is inserted in the loop attached to the stationary part of the latch. The handle is then pushed down into the position shown in the picture just as you would close the blade of a knife. The strong spring attached to the loop not only draws the doors tightly together, but also automatically locks the latch so that it cannot be opened by accident.

The latch handle can be locked shut with a padlock.

This latch is especially valuable where doors have been so warped or racked that they do not meet evenly in the middle.

No. 823 STAR Door Latches are packed in paper cartons. Weight per dozen, 10 lbs.

No. 860 Star Inside Door Latch

THE lower illustration on this page shows a latch used to draw the door up tight against the casing. This makes a stormproof connection between the door and the building. It is particularly desirable in the case of doors which have been hung for some time and do not accurately fit the opening. The construction of this latch differs but slightly from that of the latch shown above in Fig. 823; it operates in exactly the same manner. It can be locked with a padlock.

Fig. 860 STAR Inside Door Latches are packed in paper cartons. Weight per dozen, 10 lbs.

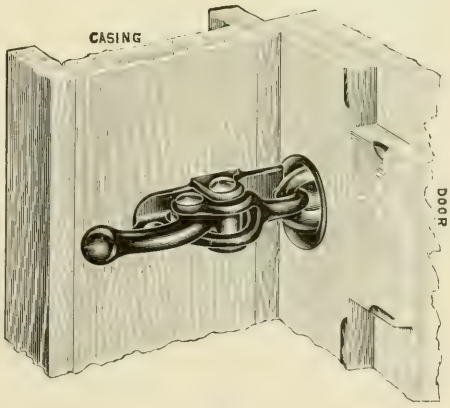


Fig. 860

No. 404 Cannon Ball House Door Hanger

IN response to repeated demands that we manufacture a house door hanger similar in construction to the Cannon Ball Barn Door Hanger we present herewith our Cannon Ball House Door Hanger and Track which possesses features of merit and advantage not found in other makes of goods of this class.

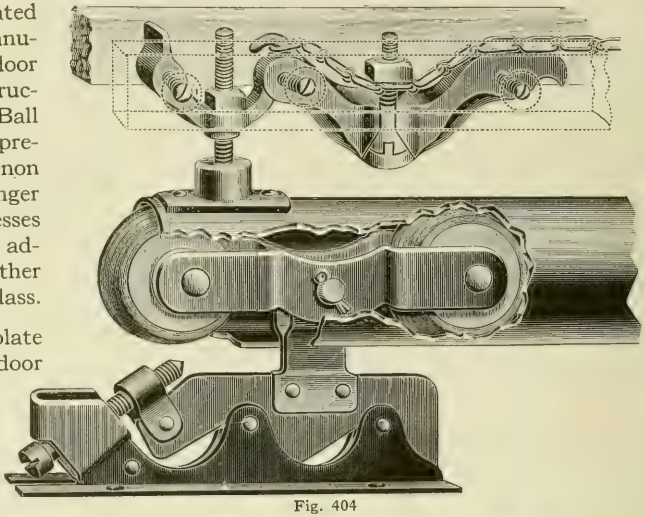


Fig. 404

The hanger and plate for attaching to the door are made of steel; the adjusting screw has an extra long bearing in the frame of the hanger, making a very strong and positive adjustment; two specially formed wheels are used which are indestructible, wide tread, leather covered, noiseless, fitted with roller bearings and are, therefore, light running.

The hangers are packed one full set or half set in a wooden box, neatly labeled. Ten full or half sets in a crate.

Weight of hangers, per pair, 4½ lbs.

The track used is made from No. 14 gauge steel, specially formed, and slotted ¼-inch on the under side to take the hanger frame. The diameter is 2¼ inches, inside measurement. The construction has been rigidly tested and is guaranteed to be entirely satisfactory.

Weight of track, per foot, 2 lbs.

Exact Size

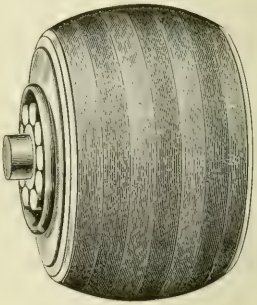


Fig. 441

Noiseless, Leather-Tread Wheel of the Cannon Ball House Door Hanger

Fig. 441 illustrates the specially formed rollers used on the Cannon Ball House Door Hanger. These rollers have steel bushings covered with sole leather washers, with a red fibre washer at either end, all of which are brought together under heavy pressure and held in place on either side by a steel washer. The wheel is then placed in a lathe and perfectly turned to the required size.

No. 411 Cannon Ball House Door Track

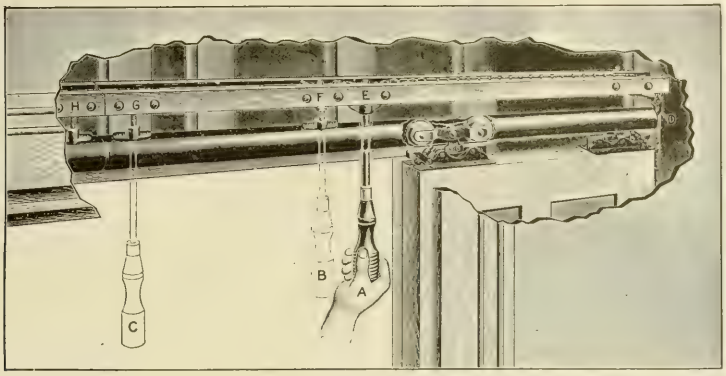


Fig. 411

THIS Track is made from No. 14 gauge steel, specially formed and slotted ¼-inch on the under side to take the hanger frame. The diameter is 2¼ inches, inside measurement. The construction has been rigidly tested and is guaranteed to be entirely satisfactory. Weight of track, per foot, 2 lbs. Furnished with two-piece hardwood header.

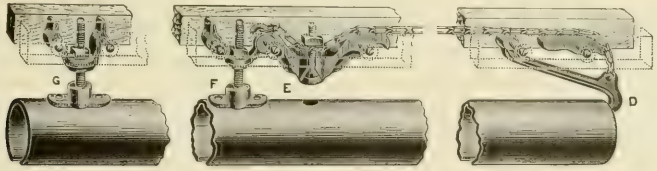


Fig. 412

Track Adjustment

We call particular attention to the track adjustment. It is not necessary to take the Cannon Ball Track down to adjust it. The track is adjusted quickly at the door opening with the use of a screwdriver only. Either end of the track may be raised or lowered as desired and secured in the adjusted position. This is a feature not found in any other house door track.

DOUBLE DOORS		DOUBLE DOORS	
No.	Size of Opening	No.	Size of Opening
24	4 ft.	27	7 ft.
24½	4 ft. 6 in.	27½	7 ft. 6 in.
25	5 ft.	28	8 ft.
25½	5 ft. 6 in.	29	9 ft.
26	6 ft.	210	10 ft.
26½	6 ft. 6 in.		

SINGLE DOORS		SINGLE DOORS	
No.	Size of Opening	No.	Size of Opening
12½	2 ft. 6 in.	15½	5 ft. 6 in.
13	3 ft.	16	6 ft.
13½	3 ft. 6 in.	16½	6 ft. 6 in.
14	4 ft.	17	7 ft.
14½	4 ft. 6 in.	17½	7 ft. 6 in.
15	5 ft.		

No. 468 Cannon Ball, Jr., House Door Hanger

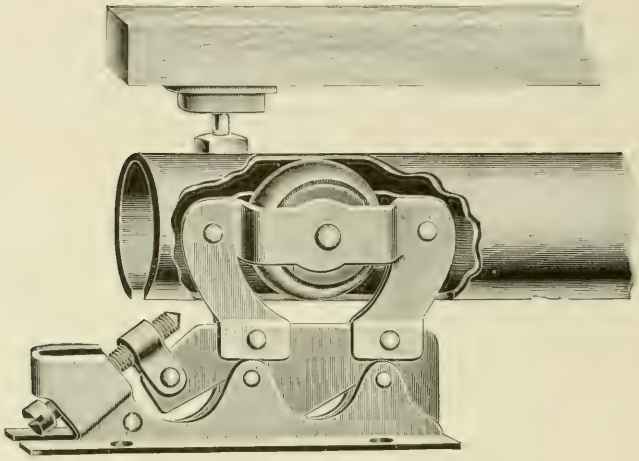


Fig. 468

FIGURE 468 illustrates the Cannon Ball, Jr., House Door Hanger, which is of the same construction and has the same adjustment as the Cannon Ball House Door Hanger. The only difference is that it has a single wheel instead of two wheels. The roller is covered with sole leather and is therefore noiseless. The track is shipped with the header attached as shown in the illustration and is easily installed and guaranteed to work perfectly.

The hangers are packed one full or half set in a wooden box, neatly labeled. Ten full or half sets in a crate. Screws, stop and floor guides packed with the hangers. Weight of hangers, per pair, 4¼ lbs. Weight of track, per foot, 2 lbs.

DOUBLE DOORS	
No.	Size of Opening
24	4 ft.
24½	4 ft. 6 in.
25	5 ft.
25½	5 ft. 6 in.
26	6 ft.
26½	6 ft. 6 in.

DOUBLE DOORS	
No.	Size of Opening
27	7 ft.
27½	7 ft. 6 in.
28	8 ft.
29	9 ft.
210	10 ft.

SINGLE DOORS	
No.	Size of Opening
12½	2 ft. 6 in.
13	3 ft.
13½	3 ft. 6 in.
14	4 ft.
14½	4 ft. 6 in.
15	5 ft.

SINGLE DOORS	
No.	Size of Opening
15½	5 ft. 6 in.
16	6 ft.
16½	6 ft. 6 in.
17	7 ft.
17½	7 ft. 6 in.
18	8 ft.

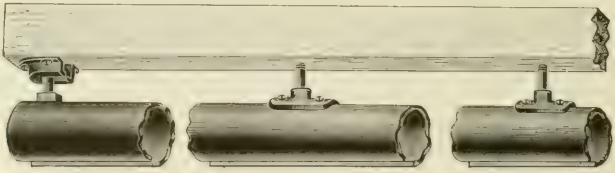


Fig. 469



STAR

Hardware Specialties

No. 844 New Star Tank Heater

Cast Iron—One Size Only

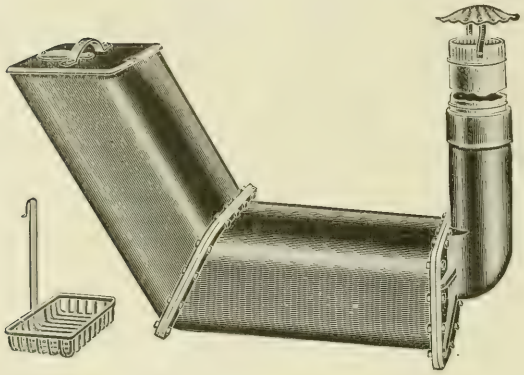


Figure 844

THE New STAR Tank Heater illustrated above is a later design of the STAR Tank Heater, which has been so long and favorably known in every state where tank heaters are used.

This New STAR Heater differs from the former type in that it has square instead of rounding corners. This heater is cast in two halves, as the illustration shows. The New STAR Heater is carefully cast of the best gray iron. Its extra weight makes it self-sinking. It is not necessary to provide for any fastenings either in cement, wood, or steel tanks.

The New STAR is a submerged heater. This means that the fire is entirely under the water so that the full benefit is derived from every bit of fuel burned. A heavy heater of this type holds the heat longer and keeps the water from freezing after the fuel is consumed.

The basket grate is held in place by a heavy, steel handle, as illustrated. The grate containing the fire is easily lifted out while the ashes are being removed and then dropped quickly into the position shown.

The New STAR Heater, height 24 inches, shipping weight, 225 pounds.

No. 242 Star Tank Heater

Cast Iron—One Size Only

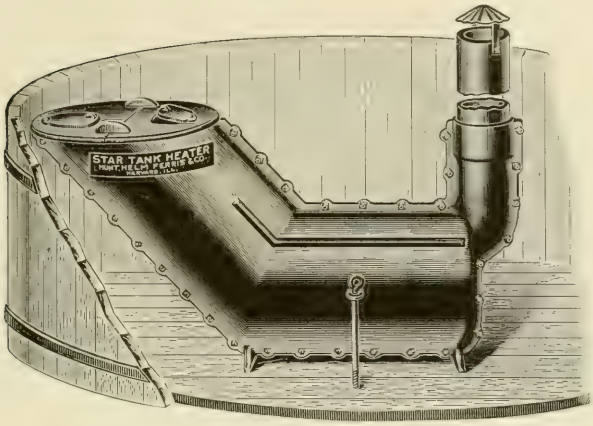


Fig. 242

THE STAR Tank Heater, shown in the above illustration, has been on the market for years and has given such an excellent account of itself that it needs no introduction in those localities where Tank Heaters are used and appreciated.

Its reputation is such that there is a continued demand for it, some preferring a heater of this shape to the square type of heater shown in the illustration of the No. 844 heater on the preceding page.

This heater is being made today, as it has been for several years past, of the very best quality of gray iron. It is a heavy heater that sinks of its own weight, thus making it unnecessary to provide for fastenings in either iron, cement or wooden tank.

This heater is built on the principle of a base burner, the heat passing around the outer shell of the heater. By this system of radiation, the heat is so thrown into the water that a maximum amount of heat is given off with a minimum amount of fuel.

Height 24 inches. Shipping weight, 240 lbs.

No. 691 New Rinkle Tank Heater

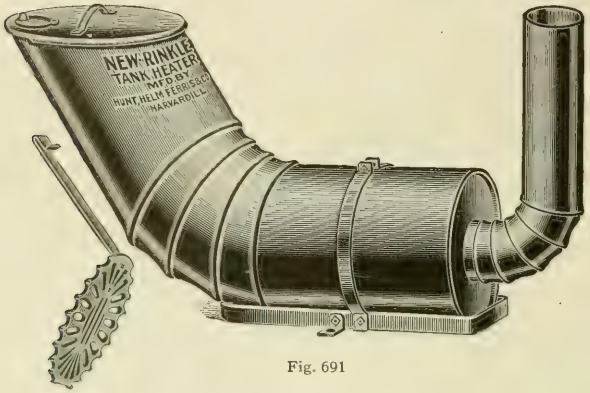


Fig. 691

THE New Rinkle Tank Heater is a submerged heater, which works on the same principle as the STAR Tank Heater shown on the opposite page, and can be used with wood, iron or cement tank.

The body of the heater is made of 14-gauge boiler iron, all except the end or head being in one piece.

The smoke pipe is of one piece, made with a flange at the base. This flange is electrically welded to the inside surface of the end of the heater, the hole in the end being cut slightly smaller than the pipe so that when the pipe is inserted it is held firmly in place.

The end of the heater is made with a flange or a rim which is welded to the inner surface of the body. This construction makes the New Rinkle one solid piece without seams. Being made of heavy boiler iron, it is proof against cracking.

The grate shown in the illustration hangs in the heater. This grate is easily lifted out and drops into position when replaced, which makes it easy to clean out the ashes.

The cover is made with a rim, which holds it in place and a handle and draft slide are riveted to the cover. As it is easy to operate and heats the most water for the amount of fuel consumed, it is a most economical heater.

The New Rinkle Heater measures 24 inches high.

Weight, 93 pounds.

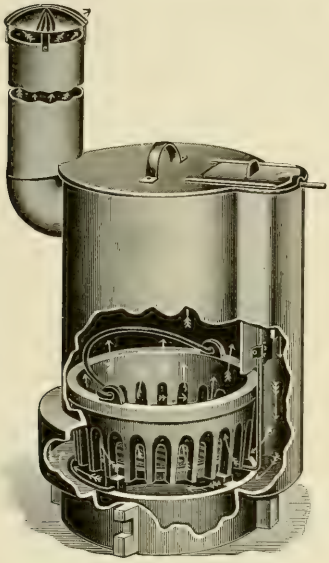


Fig. 222

No. 222 Iron King Tank Heater

THE body is one piece, the draft chamber being separated from the fire pot by a steel partition. The draft opens at the lower end into the drum shaped portion of the body casting surrounding the basket grate, insuring an abundance of draft at all times. This heater has a cast iron ash pan and a grate shaker.

One size only. Diameter, 14 inches. Height, 24 inches. Shipping weight, 143 lbs.

No. 223 Iron King Stay-Down Tank Heater

THE illustration opposite shows the Iron King Heater same as above, with the addition of a weight casting which anchors the heater in the bottom of a galvanized or wood tank without the use of stay rods of any kind. This is the heater that the trade has been looking for. Sells on sight.

One size only. Diameter, 14 inches. Height, 24 inches. Shipping weight, 173 lbs.

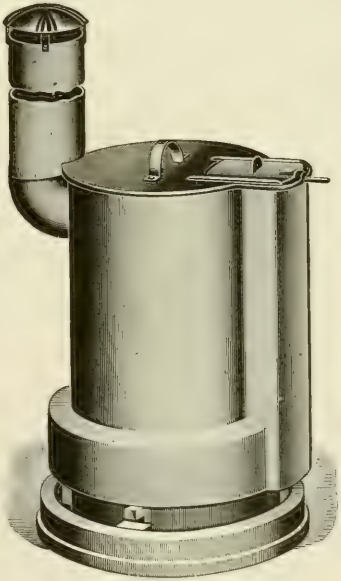


Fig. 223

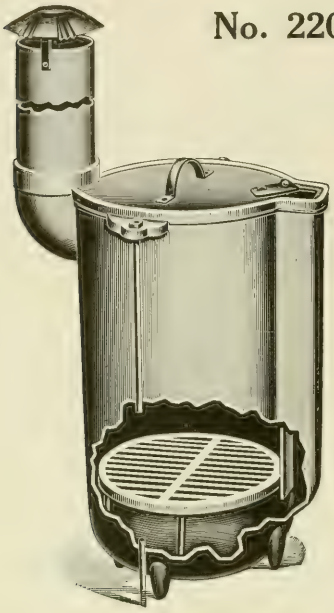


Fig. 220

No. 220 Black Jack Tank Heater

Flat Grate

THIS heater is made of cast iron. The body is one piece, durable and heavy. No leak is possible. Furnished with flat grate. The entire top lifts off, allowing the easy removal of the ashes. The air chamber is a part of the body casting and, therefore, just as durable as any other part of the heater. Height of either size, 24 inches.

No. 1. Diameter, 14 inches. Shipping weight, 115 lbs.

No. 2. Diameter, 17 inches. Shipping weight, 147 lbs.

No. 221 Black Jack Tank Heater

Basket Grate

THE body casting on this heater is the same as on the heater shown above. This heater is furnished with basket grate. Height of either size, 24 inches. We furnish both heaters shown on this page with heat deflector where desired. Too much cannot be said in favor of the deflector. It is so constructed that the heat is conducted entirely around the outer surface of the heater before it enters the smoke pipe. It is a great fuel saver.

No. 1. Diameter, 14 inches. Shipping weight, 110 lbs.

No. 2. Diameter, 17 inches. Shipping weight, 151 lbs.



Fig. 221



Fig. 214

No. 214 Standard Tank Heater

THE heaters shown on this page are made of galvanized steel, both body and bottom. They will last much longer than those made of common black steel. The Standard Heater has a hinged grate, so that one-half can be raised with the poker and the ashes taken out without putting out the fire. Long, straight-handled shovel and poker furnished with each heater. Height of both sizes, 24 inches.

No. 1. Diameter, 16 inches. Shipping weight, 40 lbs.

No. 2. Diameter, 19 inches. Shipping weight, 60 lbs.

No. 215 Harvard Tank Heater

THE heaters shown on this page are tested with water before leaving the factory and warranted not to leak. The Harvard Heater has a basket grate. The fire can be taken out with the grate and replaced, thus saving the trouble of rekindling. Special long-handled shovel and poker furnished with each heater. Height of both sizes, 24 inches.

No. 1. Diameter, 16 inches. Shipping weight, 45 lbs.

No. 2. Diameter, 19 inches. Shipping weight, 65 lbs.



Fig. 215

No. 498 Giant Star Tackle Block Wire Stretcher

Plain or Roller Bearing

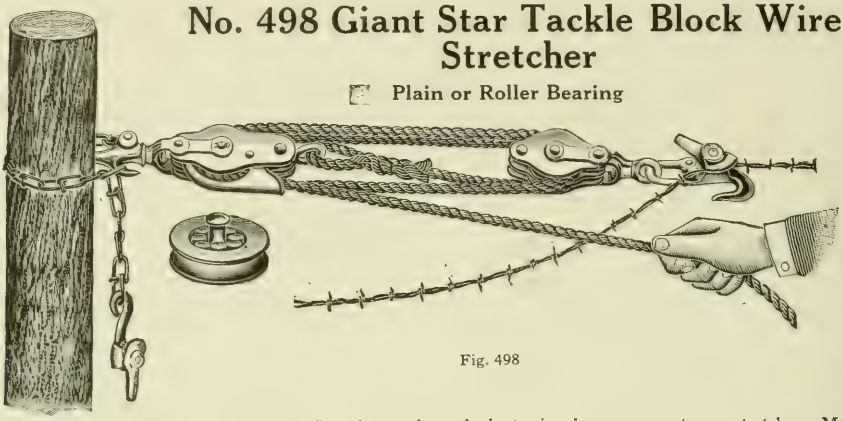


Fig. 498

THE largest and most powerful Wire Stretcher made. Quick, absolutely sure. Never slips, for the heavier the pull, the better the lock holds. A one-pound pull on the rope is equal to four pounds on the wire. Self-supporting from the post and locked and unlocked by a simple right or left movement of the hand. Made with steel blocks and malleable straps. Removable steel axles and hardened steel roller bearings. Equipped with the best wire clamps ever put on a stretcher. Manufactured in three sizes, as shown on this page.

Giant STAR Roller Bearing Tackle Block Wire Stretcher, finished in gray enamel, 3-inch sheaves, strung and wrapped with 23 feet of ½-inch manila rope, weight, per dozen, packed for shipment, 120 lbs.

Also made plain bearing, finished in red enamel.

No. 714 Giant Star "Jr." Tackle Block Wire Stretcher

Plain or Roller Bearing

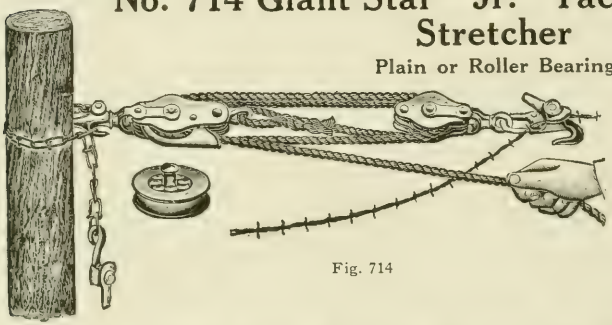


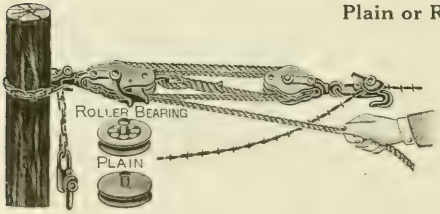
Fig. 714

A VERY popular number, identical in construction with No. 498, shown above, only with 2½-inch diameter sheaves. Strong, positive and efficient. Giant STAR "Junior" Roller Bearing Tackle Block Wire Stretcher, finished in gray enamel, strung and wrapped with 20 feet of ½-inch manila rope, 2½-inch sheaves. Weight, per dozen, packed ready for shipment, 108 lbs.

Also made plain bearing, finished in red enamel.

No. 482 Star Tackle Block Wire Stretcher

Plain or Roller Bearing



SAME as two numbers above, only made with smaller blocks and 2-inch sheaves. STAR Roller Bearing Tackle Block Wire Stretcher, finished in gray enamel, strung and wrapped with 16 feet of ⅜-inch manila rope.

Weight, per dozen, packed ready for shipment, 66 lbs. Also made plain bearing, finished in red enamel.

No. 188 Star Malleable Tackle Block Wire Stretcher

(Patented)

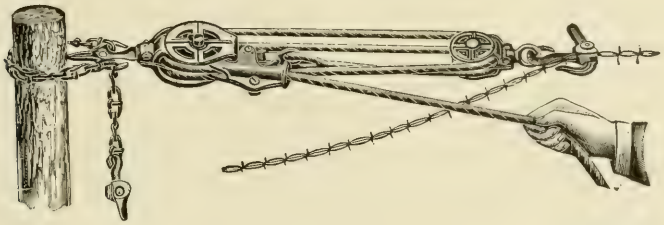


Fig. 188

IN the STAR Malleable Tackle Block Wire Stretcher each block is constructed with a swiveling hook. Rope sheaves are covered and revolve on steel axles. Axles are headed at one end and held by cotter pin at the other, making it easy to replace sheaves whenever necessary.

A one-pound pull on the rope is equal to four pounds on the wire. Self-operating clamp holds the rope firmly at any point. It is locked and unlocked simply by moving the hand to right or left.

Strung with 16 feet of 3-8 inch rope, ready for use.

Weight, per dozen, 54 pounds.

No. 400 Star Steel Tackle Block Wire Stretcher

Plain or Roller Bearing

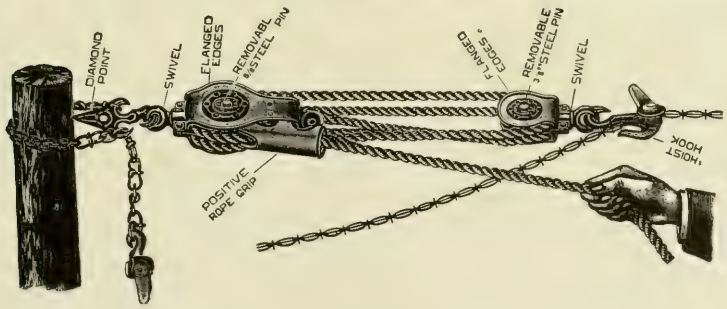


Fig. 400

THE STAR Steel Tackle Block Stretcher is self-supporting at the post. Each block is constructed with a swiveling hook and the side plates have flanged edges which prevent wear on the rope.

Each block has a removable pin held in place by a cotter, so that a sheave can be replaced when necessary. The eccentric clamp used on the rear block is constructed with a hook so that the stretcher can be used for a hoist if desired.

Strung with 16 feet of 3-8 inch rope, ready for use. Finished in gray enamel.

Also made plain bearing, finished in red enamel.

Weight, per dozen, 48 pounds.

No. 190 Ellwood Pattern Wire Stretcher

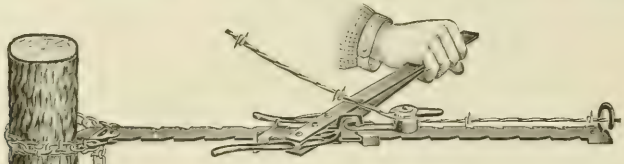


Fig. 190
Cut Showing Construction of the Improved Ellwood

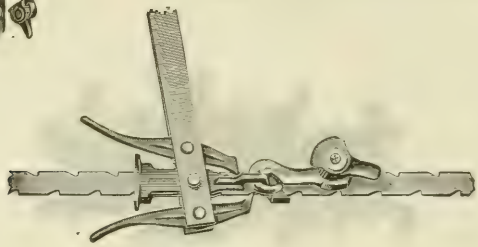


Fig. 191½

THE Ellwood Wire Stretcher has been on the market for the past twenty years and is known as the best flat bar wire stretcher made. Note that our stretcher is self-supporting at the post. Packed three dozen in a case. The weight per dozen, packed for shipment, is 54 lbs.

No. 191 Ellwood Rod Wire Stretcher

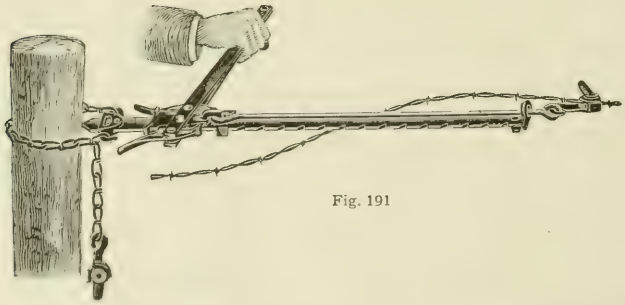


Fig. 191

ABOVE we illustrate the Ellwood Wire Stretcher with rod extension. This Stretcher having been furnished to the trade for many years, is well known and no extended description is necessary. Note, please, that it is self-supporting at the post, which is a patented feature of all our wire stretchers.

Packed three dozen in a case. The weight per dozen, packed for shipment, is 66 lbs.

No. 193 Star Round Bar Wire Stretcher

THE smooth, round bar enables the operator to use the lever in any position on the upper or under side of the bar and on either side of the fence. It grips the bar at any point desired and never slips.

The weight per dozen, bundled for shipment, is 60 lbs.

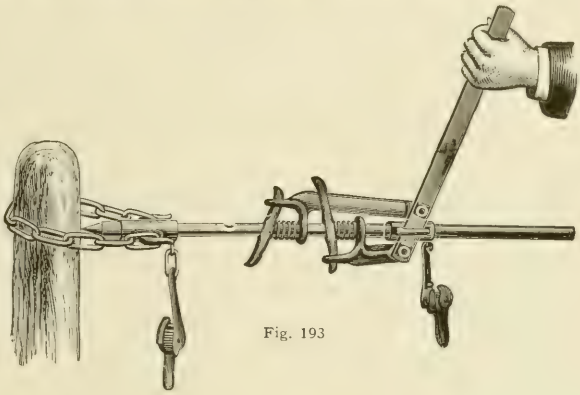


Fig. 193

No. 197 The Little Giant Wire Stretcher

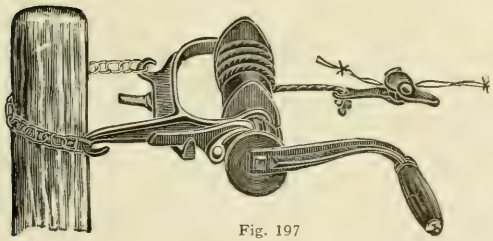


Fig. 197

THIS stretcher excels anything made in the line of crank stretchers. It is particularly adapted for export trade.

No. 281 Little Giant, Sr., with chain for attaching to post, per dozen. 51 lbs.

No. 197 Little Giant, Jr., with rope for attaching to post, per dozen, 48 lbs.

No. 196 Improved Dean Wire Stretcher

HAS notches on one side of the bar only. The price being less than the Elwood makes it a good flat bar stretcher to sell at a low price.

The weight, per dozen, bundled for shipment, is 50 lbs.

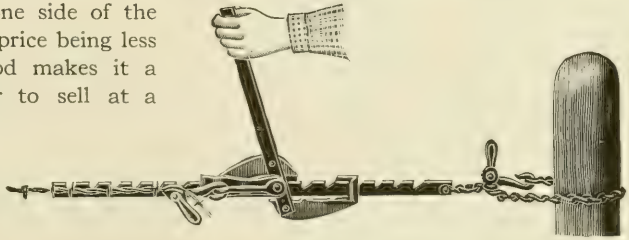


Fig. 196

No. 200 Sampson Woven Wire Stretcher

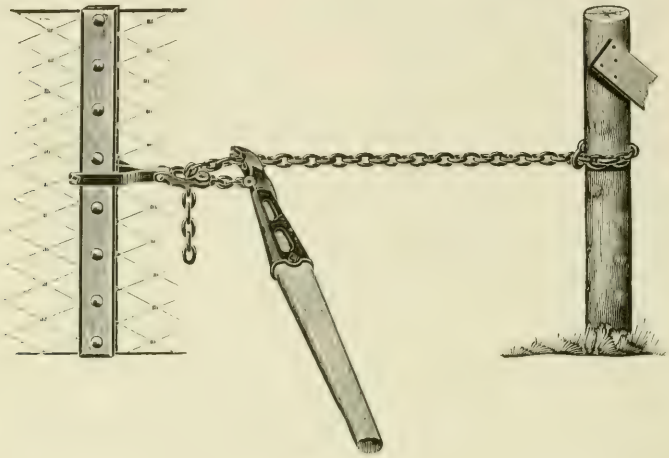


Fig. 200

THIS stretcher answers perfectly the demand for a first class woven wire stretcher of sufficient strength to sustain any pull with enough power to stretch any length of fence desired. The Sampson fits the case exactly for it is strong enough to stand any strain necessary to make the fence snug and tight.

It is made very simple in operation and construction and works perfectly. Every movement of the powerful handle stretches the wire several inches. The grip engages the chain firmly and is easily moved when slackened. Handle is 5 feet long, clamping bars 4 feet 6 inches long, both of hardwood. Eight feet of ⅜-inch tested chain with each stretcher.

The Sampson is furnished with handle without extra charge. Weight each, 35 lbs.

No. 858 Star Stable Broom

STAR Stable Broom, shown at the right, is made of the best African bass fiber. The block and handle are of carefully selected wood. While the broom is designed for stable use, it can also be used for sweeping any floor, platform or pavement where there is heavy sweeping to be done.

No. 858 STAR Stable Broom, 14-inch size, weight per dozen, without handle, 32 lbs.

No. 859 STAR Stable Broom, 16-inch size, weight per dozen, without handle, 35 lbs.

Handles for STAR Stable Brooms, weight per dozen, 24 lbs.

No. 822 Star Sidewalk Scraper

THE STAR Sidewalk Scraper has a blade of heavy pressed steel, firmly bolted to the malleable iron frame which fastens it to the handle.

The blade is so curved that when handling slush or snow up to four or five inches deep, a good, vigorous push will send the snow beyond the edge of the walk.

The blade is so shaped that the scraper can also be operated by pulling. The illustration at the left shows a scraper being pulled, and the small, round picture at the bottom of the page shows the same scraper in position for pushing.

The blade is 18 inches long and the scrapers, complete with handles, weigh 63 lbs. per doz.



Fig. 858

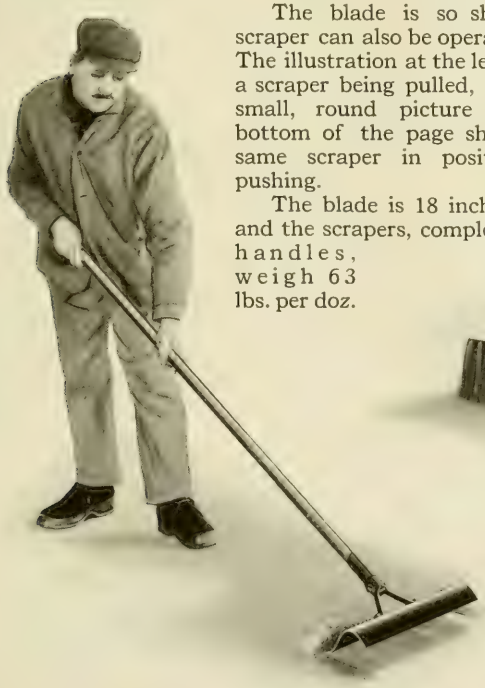


Fig. 822



Giant Star Self-locking Steel Hoists

A DEVICE may be adjustable, and that is all very good, but it may adjust automatically, and that is far better.

All sizes of STAR Roller-bearing Steel Hoists are automatically adjustable, that is—three different sizes of rope may be used in any size hoist and the lock of the STAR Hoist automatically adjusts itself to the size of rope.

Suppose you are using one-half inch rope with a No. 22 Giant STAR Hoist and wished to change it to three-eighths inch or five-eighths inch rope; this may be done; the automatic adjustable lock will take care of either size.



Fig. 565

Showing Upper Block and Location of Roller Bearings

Suppose you are using a Giant STAR Hoist on outside work and the rope becomes soaked and much swollen. It is not necessary to do any adjusting as the rope lock on all Giant STAR Hoists automatically adjusts itself to meet conditions.

Fig. 565 shows the location of the Roller Bearings and Axle of the Giant STAR Hoists. It also shows the construction of the lock and gripping dog.

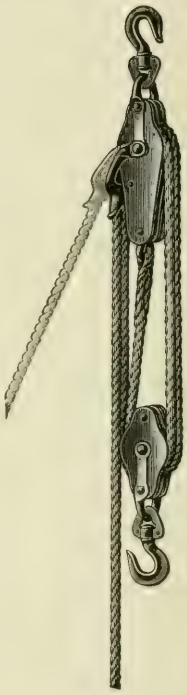


Fig. 506

Shows Manner in Which Hoists Automatically Lock

When the draft rope which passes through the lock is pulled slightly away from the block, as shown in Fig. 506, the gripping dog revolves on the stationary pin, which holds it. This operation throws the gripping dog into contact with the rope, and automatically locks it. The Giant STAR Hoist is the only hoist on the market with an automatic adjustable lock.

Giant Star Roller Bearing Steel Hoists

A Few Important Features

1. Steel blocks throughout, triple, double and single sheave, both upper and lower.

2. A heavy reinforced, drop forged yoke on each block is attached to the axle pin. The hooks are attached to this yoke by a special double pressed and riveted swivel, which slides on this yoke, making the block very flexible.

3. The hooks are extra heavy, reinforced, drop forged and very strong.

4. The sheaves revolve on hardened steel axles, fitted with cold rolled steel bearings, reducing the friction to a minimum.

5. The axles are held in place and can be instantly removed and replaced at any time if desired. These are key axles—an important point. They will not turn when heavily loaded, thus avoiding cutting the sides of the hoist.

6. The lock, which is the vital feature of the hoist, is made of malleable iron and is attached to the axle pin, making it very quick, sure, safe and easy in operation. This lock is on the draft rope. You do not have to use any special locking rope on the Giant STAR. When you stop pulling and move the draft rope slightly outward away from the block or if pulling in that direction, the hoist instantly locks. The heavier the load, the more securely it holds and locks. The lock is released instantly by a slight pull or a little snap of the rope towards the block. The Giant STAR Hoist elevates, lowers, locks and unlocks with one rope only.

7. These hoists are furnished in battleship gray enamel finish. All hoists furnished without rope.

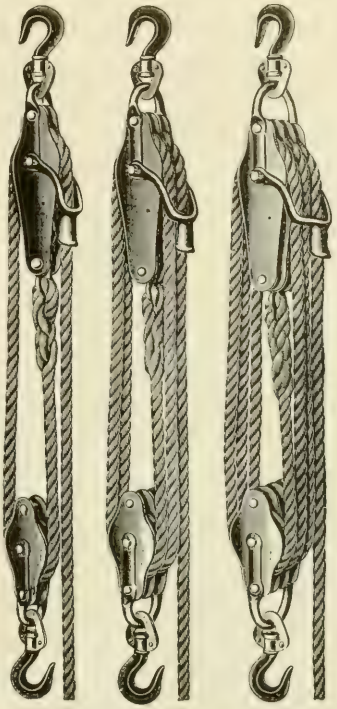


Fig. 505

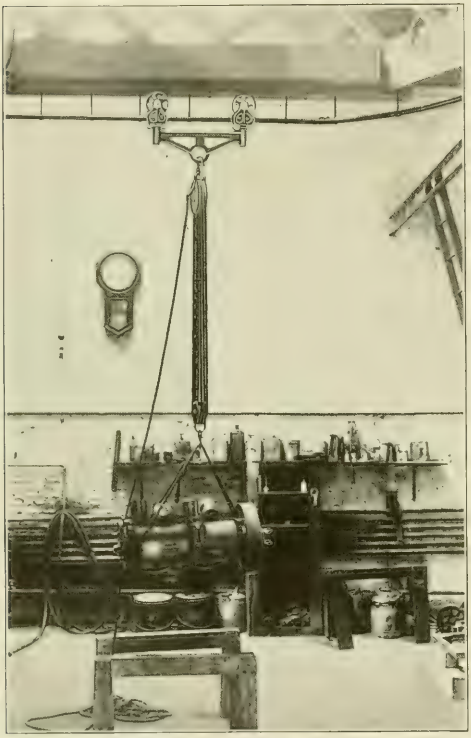
Made in thirteen sizes as follows:

No.	Sheaves Above	Sheaves Below	Size of Rope	Diameter	Approx. Capacity	Weight, Lbs. Each
2	2	2	3/8 in.	2 in.	1,000 lbs.	4
21	1	1	3/8-1/2 in.	2 1/2 in.	2,000 lbs.	5
22	2	2	3/8-1/2 in.	2 1/2 in.	2,000 lbs.	6
23	3	3	3/8-1/2 in.	2 1/2 in.	2,000 lbs.	8
31	1	1	1/2-5/8 in.	3 in.	4,000 lbs.	6
32	2	2	1/2-5/8 in.	3 in.	4,000 lbs.	8
33	3	3	1/2-5/8 in.	3 in.	4,000 lbs.	9 1/2
41	1	1	5/8-3/4 in.	4 in.	6,000 lbs.	10 1/2
42	2	2	5/8-3/4 in.	4 in.	6,000 lbs.	14 1/2
43	3	3	5/8-3/4 in.	4 in.	6,000 lbs.	18
51	1	1	3/4-7/8 in.	5 in.	8,000 lbs.	13
52	2	2	3/4-7/8 in.	5 in.	8,000 lbs.	18 1/2
53	3	3	3/4-7/8 in.	5 in.	8,000 lbs.	23 1/2

Bear in mind, please, that this is the only complete line of self-locking, roller-bearing hoists on the market.

No. 547 Star Trolley Conveyor

Used in Connection With STAR Roller Bearing Self-Locking Steel Hoists



Showing STAR Trolley Conveyor in Actual Use.

For Use in Garages, Machine Shops, Warehouses, etc.

HERE is an inexpensive special type of roller bearing conveyor which may be used for a great variety of purposes. For the garage, in taking the engine out of the car to the bench and back again; for use in warehouses and factories, for carrying coal or any purpose where a load up to 1,000 lbs. is to be carried quickly and safely.

The conveyor is constructed of steel and malleable iron. The four tracker wheels are each 4½ inches in diameter, revolving on hardened steel axles fitted with cold rolled steel bearings. The trucks are malleable iron and are attached by swivel to a malleable frame. A clevis is attached in the middle of the frame from which may be suspended any one of our roller bearing steel hoists. The construction of the Conveyor trucks make it impossible for it to jump the track.

The track on which the conveyor runs may be hung in several directions with branch lines either parallel or at angles to the main line.

The load is automatically locked and carried at any desired height.

This is a great labor saver and can be arranged to meet every condition and need.

Send us a sketch of your floor and requirements for complete plans, estimates and suggestions.

Weight of Conveyor, 28 lbs.

Details of Star Trolley Conveyor

Used in Connection with the STAR Roller Bearing Steel Hoists

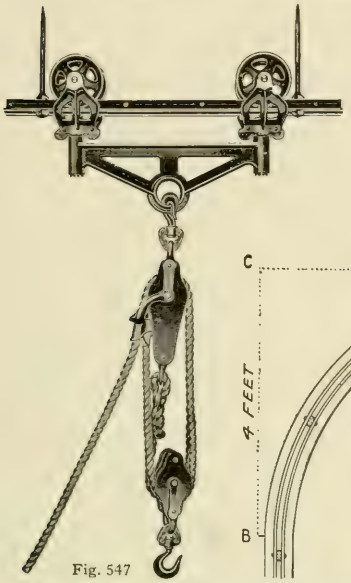


Fig. 547



Fig. 414

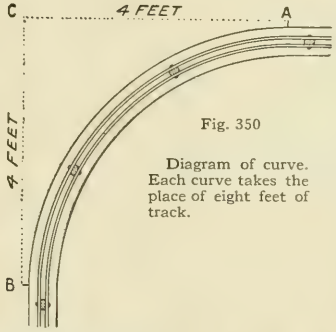


Fig. 350

Diagram of curve. Each curve takes the place of eight feet of track.

THE track on which the STAR Trolley Conveyor runs is the STAR Double Angle Steel Track, page 000, which by means of the Lag Screw Hanger (Fig. 414) can be suspended from the joists and adjusted absolutely even. Length of regular hangers is 10¼ inches, although we furnish longer hangers when necessary. The track weighs 2 lbs. per foot and the Hangers are placed one foot apart.

STAR Switches and Curves enable you to make the Track conform to practically any overhead arrangement desired.

Owing to the fact that each job has different requirements, the best way is to send us a floor plan indicating how you want to use the Conveyor and our Drafting Department will prepare sketches and estimates without cost or obligation to you.

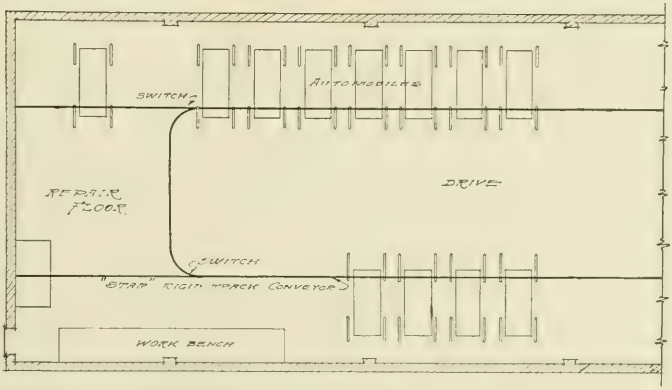
Specimen Installation of Star Trolley Conveyor

(For the Manley Garage)

STAR Trolley Conveyor has made good with us. It's certainly GREAT. It is never around in the way, but is always handy when needed. Nothing could do the work better, if it cost ten times the few dollars this outfit costs us.

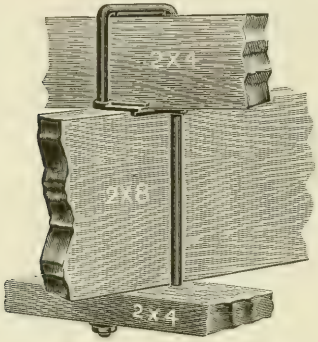
Manley Garage,
Harvard,
Illinois.

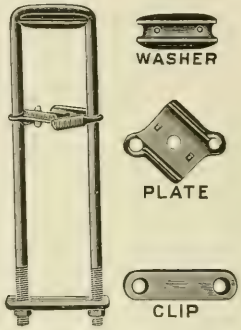
P. S. Can't make it too strong. It works finer than silk.



FLOOR PLAN OF MANLEY GARAGE
HARVARD, ILL.

New Star Hay Rack Clamps





THE use of bolts in constructing hay racks is out of date. The boring of holes in the timber is not only useless work, but it deprives the timbers of practically one-half of their strength. This can be avoided by the use of the STAR Hay Rack Clamp. No holes are necessary where the STAR Hay Rack Clamp is used, and the full strength of the timbers is thus retained.

The STAR Hay Rack Clamp is so simple that any one can put a rack together with it, the only tools needed being a wrench and a saw. The time and labor saved in the making of the rack will pay part of the cost of the clamps.

When the clamps are tightened the rack is rigid, and the intermediate bracket being studded and flanged, twisting or slipping of the timbers at the joints is impossible. The clamps, which are placed astride the timbers are twice as strong as bolts. A grooved steel washer makes it impossible for the clamp to cut into the cross-piece, and the steel clip or washer keeps the bottom cross-piece from splitting.



STAR Hay Rack Clamps are made in four different sizes, put up one set of 8 clamps in a box, as shown above:

No. 0.	Star Hay Rack Clamp, 12-inch.	11½ lbs. per set.
No. 1.	Star Hay Rack Clamp, 14-inch.	12½ lbs. per set.
No. 2.	Star Hay Rack Clamp, 16-inch.	13½ lbs. per set.
No. 3.	Star Hay Rack Clamp, 18-inch.	15 lbs. per set.

Harvard Hay Rack Fixtures

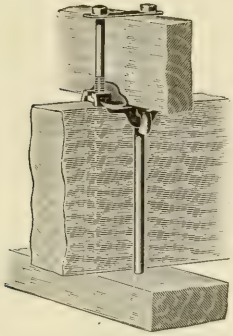


Fig. 11



Fig. 14



Fig. 15

WE desire to call your attention to Harvard Hay Rack Fixtures as illustrated. The demand for a suitable and convenient set of hay rack irons has induced us to put on the market what we believe to be the simplest and best device of this kind ever offered. Bolts for hay racks are out of date. The timbers are weakened by boring holes. They are inconvenient to use and do not make a strong rack. By using Harvard Hay Rack Fixtures it is not necessary to bore holes in the timbers and they are so simple in construction that anyone can use them.

A new and excellent feature of the Harvard Hay Rack Fixture is that it is so constructed that it is not necessary to hold the three pieces of the rack embraced by the fixture in place to be clamped all at one time. For instance, the lower cross pieces and the stringers which rest on them can first be clamped together and then the upper cross pieces can be laid on and clamped in place. This feature makes it very simple to assemble the rack.

Another advantage which the Harvard Hay Rack Fixtures have, on account of the features above described, is that the top of the hay rack may be removed, leaving the two stringers and lower cross pieces, making a wagon box. This will be found to be a very handy attachment and one that will favorably impress the users of hay racks.

Made in four sizes

No. 1.	14 inches long, for 2 x 4 cross pieces, 2 x 8 bed pieces.	Weight, per set, 14 lbs.
No. 2.	16 inches long, for 2 x 6 cross pieces, 2 x 8 bed pieces.	Weight, per set, 15 lbs.
No. 3.	16 inches long, for 2 x 4 cross pieces, 2 x 10 bed pieces.	Weight, per set, 17 lbs.
No. 4.	18 inches long, for 2 x 6 cross pieces, 2 x 10 bed pieces.	Weight, per set, 18 lbs.

No. 60 Star Manhole Ring and Cover

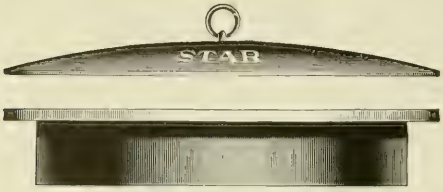


Fig. 60
Showing Cover Removed



Fig. 61
Showing Cover in Place

THE above illustrations show the STAR Manhole Ring and cover. Every dealer has many calls for these for covering cesspools, outdoor cisterns, gas depositaries, etc.

Diameter of ring, 22¾ inches.
Diameter of cover, 20½ inches.
Weight, complete, 46 lbs.

No. 435 Star Offset Hinges

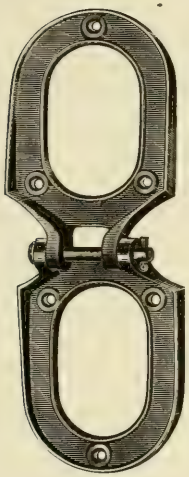


Fig. 435
Hinge

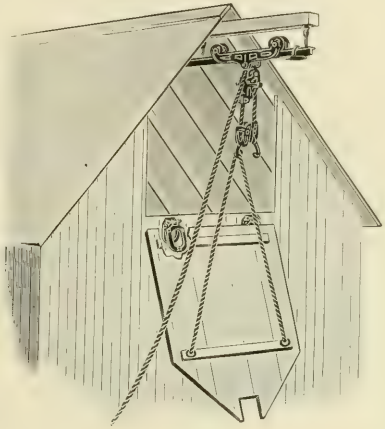


Fig. 436
Hinge on Gable Door

THE STAR Offset Hinge is for use on the Hay Door in the gable end of the barn when hay is taken in at the end of the barn. The door, which should be cut in at the top of the gable, should be 10 feet wide by 12 feet high, when harpoon fork is used and 12 feet wide by 15 feet high where slings are used.

By using STAR Offset Hinges rain or snow will be kept out of the gable end of the barn. In Fig. 436 we show the method by which the door can be raised when desired by attaching a rope fastened to the door to one of the pulley blocks attached to the Carrier, and by running the Carrier into the barn by means of the draft rope the door will be pulled up instantly.

STAR Offset Hinges are made of malleable iron and the upper and lower parts of the Hinges are held together by steel pins and cotters.

Weight of hinges, per set, 3 lbs.

No. 225 Star Anvil and Vise

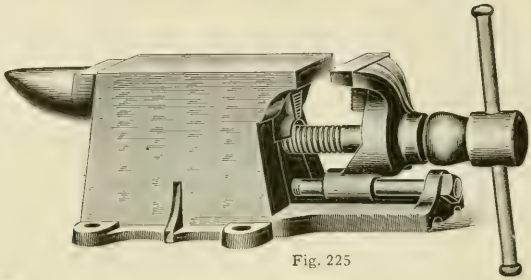


Fig. 225

A VERY useful and convenient tool. No mechanic or farmer can afford to be without one. Face hardened and polished. Wrought iron screw. Face 3 x 7 inches. Jaw will open 4 inches. Will hold gas pipe or round iron.

Weight each, 22 pounds.

No. 492 Star Stake Holder

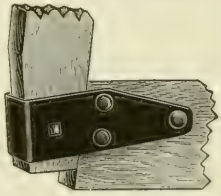


Fig. 492

THE STAR Stake Holder is made of steel, 2½ inches in width, and ⅛-inch in thickness, intended to hold a 2 x 4 or 2 x 3 inch stake, tapered at the lower end. It is fastened to the ends of the cross timbers of the hay rack by means of bolts so that the side stakes will fit securely into this holder, as shown.

Weight, per dozen, 15 pounds.

No. 64 Star Boat Anchor

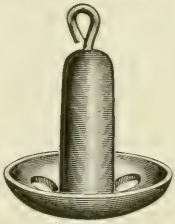


Fig. 64

THE STAR Boat Anchor is 12 inches high. Its base is 8½ inches wide.

The STAR Anchor is the most practical type made for row-boat requirements. It attaches to the bottom easily and surely, and at the same time can be disengaged and lifted easily and quickly, the water running out through the holes in the base.

The STAR Boat Anchor will not catch on snags.

Weight each, 18 pounds.

No. 233 Star Windmill Regulators

One of the Most Useful Inventions Ever Offered to the Public

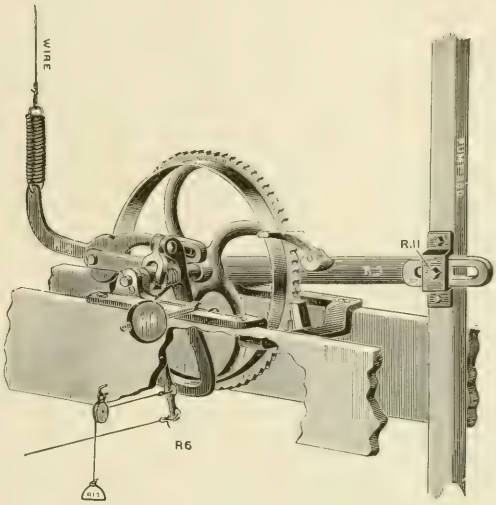


Fig. 233

BECAUSE this machine takes full charge of the windmill.

Because it pulls the mill out of gear before the tank overflows.

Because it will allow the mill to go into gear when the water is lowered in the tank.

Because it does away with the mudholes around the tank.

Because it saves water.

Because it saves the mill and does not allow it to do any pumping when it is not necessary.

Because the farmer does not have to go and put the mill in and out of gear.

Because it will work on any windmill.

Because it will work just as well when the tank is at a distance from the mill.

Because it will do its work when you are asleep, when gone to town, or when in the field.

Weight, each, 40 lbs.

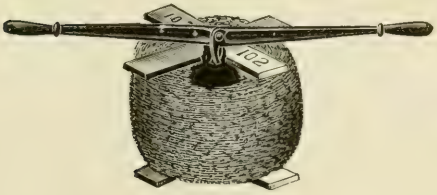


Fig. 187

No. 187 Star Wire Lifter

MADE of best malleable iron. Length, 36 inches. Weight, 3 lbs. Indispensable for handling wire.



A Word About Wagons

THE two BIG things about a wagon are—STRENGTH—LOOKS. The appearance of Overland Wagons sells them on sight. Clear, clean, white ash boxes finished with two fine coats of implement coach varnish, covered on the bottom as well as on the sides—an honest job of finishing, artistically striped, scrolled and stenciled. Every single part is finished carefully, no daub or "slab" work on our goods.



This, because we realize that "looks" make the first sale and our quality shows at a glance or on minute inspection.

But while "looks" may make the first sale, "durability" is what makes the repeat orders. And from a "wear" standpoint, our wagons are in a class by themselves. The rim of the wheels is pressed around the spokes, making it impossible for them to loosen. An all-steel construction below the box and a brace from the bottom of the bed to the front axle so when a boy runs into the curb or telegraph pole, his wagon is still in service. This is an exclusive feature with us.

The full roller bearing axles make our wagons an easy pull for a three-year-old. In our construction are embodied all modern improvements and many exclusive features which make Hunt, Helm, Ferris & Co. Wagons the most saleable and satisfactory on the market today.

Overland Coaster Wagon

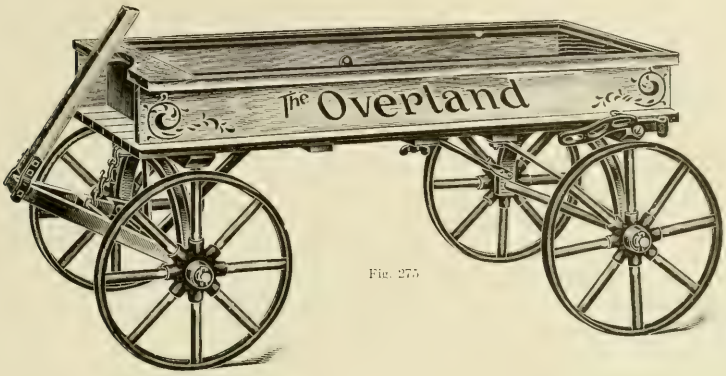


Fig. 275

SPECIFICATIONS

BODY—Clear white ash, natural finish, trimmed in red and stenciled in black and green.

GEARS Channel arch truss steel construction, enameled black.

FIFTH WHEEL—Extra large, made of steel.

AXLES—One-half inch round steel, firmly braced front and rear.

WHEELS—Heavy iron hub into which straight, smooth, kiln-dried hardwood spokes are driven. Felloes and tires of heavy steel, electrically welded, with edges curled in to hold the ends of the spokes.

BEARINGS—Each wheel fitted with eleven cold rolled steel bearings, held in place by a special washer that does not wear cotter pin.

TONGUE—Hard, straight maple which bends back and allows wagon to be steered from box.

BRAKES—Malleable iron.

Overland Coaster Wagon

With Box Removed

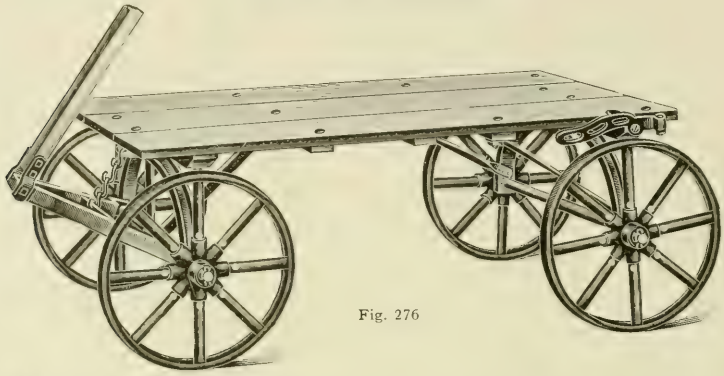


Fig. 276

THE express box on all Overland Coaster Wagons can be instantly removed or replaced. The wagon may be changed from express to coaster in a minute.

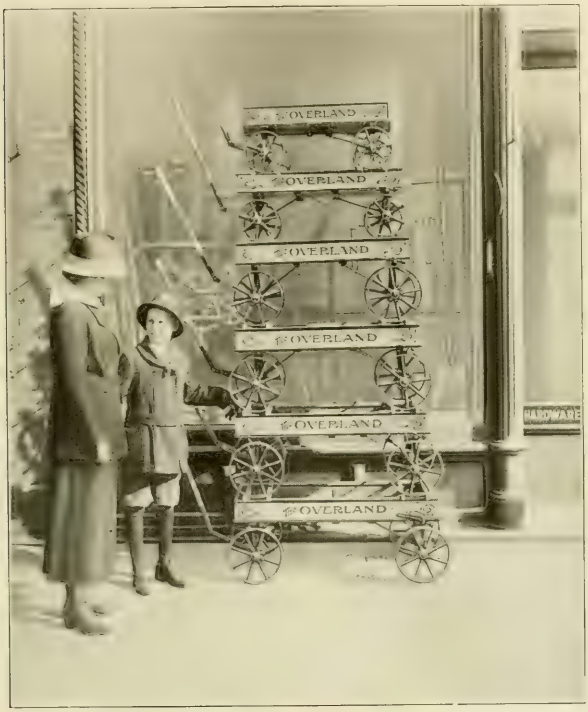
A simple connection, easily operated, locks box firmly to the bed.

Overland Wagons are furnished in the following sizes:

No.	Bed Inches	Wheel Diameter Inches	Style Brake	Weight Lbs. Per Doz.
0A	12 x 28 in.	8 in.	Hand	288
1A	14 x 32 in.	8 in.	Hand	312
2A	14 x 34 in.	11 in.	Hand	396
2½A	15¼ x 36 in.	11 in.	Hand	414
3A	16 x 38 in.	11 in.	Hand	438
4A	18 x 40 in.	11 in.	Hand	492



Automatic Wagon Salesman



Goods Attractively Displayed Are More Than Half Sold

And these Wagon Display Fixtures make the wagons look extra good to the folks who are going to buy them.

Put a rack of our wagons out in front of your store—let our goods do their own talking—sales will come almost of themselves. Results from the use of Display Fixtures will show you why dealers who have used it, call it the "AUTOMATIC WAGON SALESMAN."

A Glimpse of the Factory Behind Star Goods

THERE are a little over 3,000 people in Harvard, Illinois, where the Hunt, Helm, Ferris & Co.'s factory is located.

Statisticians tell us that the average family consists of five people.

Consequently about half the population of Harvard are dependent upon the Hunt, Helm, Ferris & Co. factory.

Our workmen have practically been brought up in the business.

Our factory covers more than six acres of floor space.

Every kind of modern labor-saving machinery is included in the equipment.

Cost of production is down to the minimum.

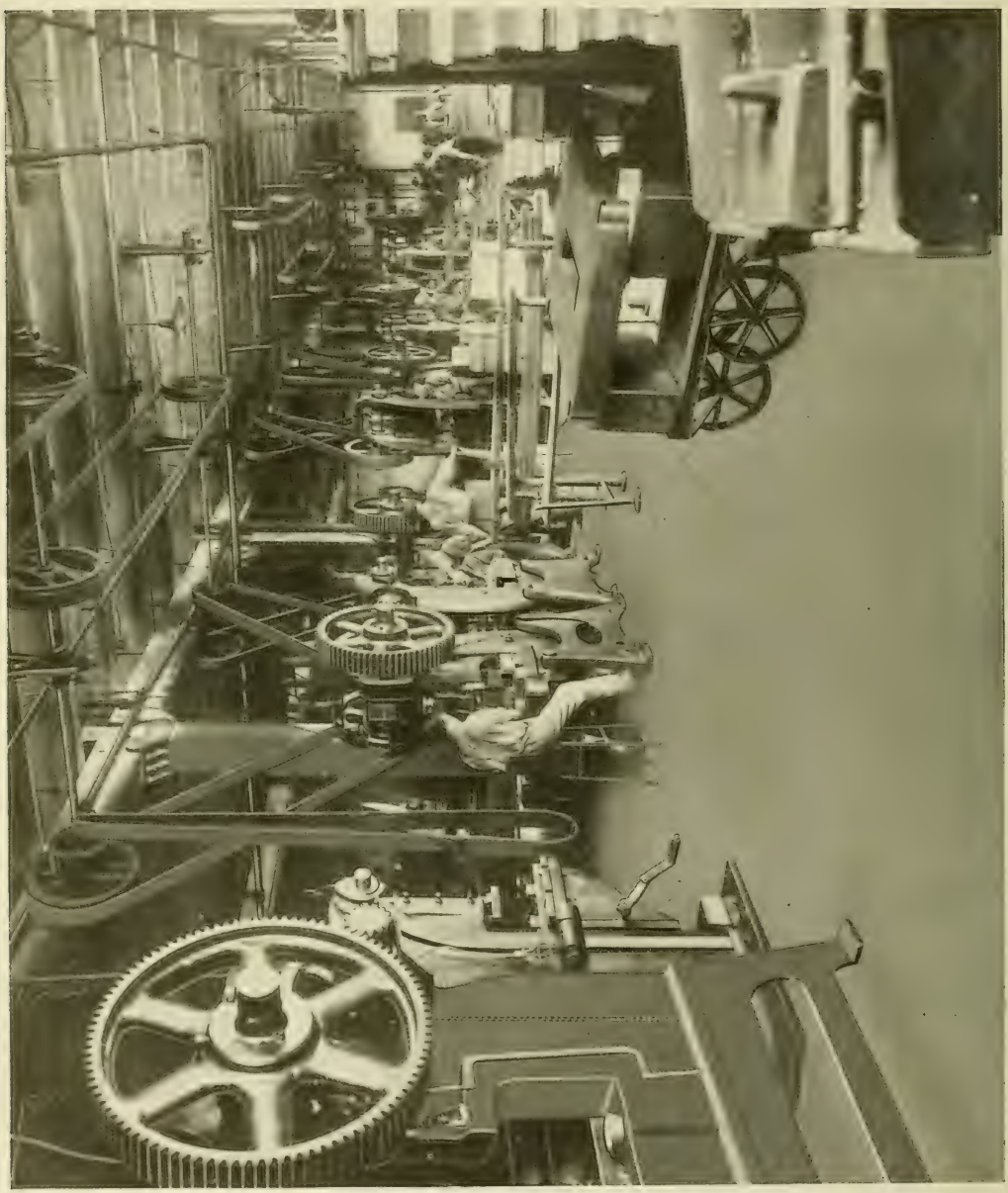
There's nothing we would like better than to have you make a trip through our factory in person.

But the next best thing is to look over the photographs of different parts of our plant reproduced in the following pages.

And it's all the result of thirty-six years of giving people full value for their money.



General Office of Hunt, Helm, Ferris & Co.



Press Room

Machine and Tool Shop





Wood Working Room

Foundry





Section of Paint Shop

Section of Shipping Room



General Assembly Room

Barn Equipment Assembly Room

125 Good Reasons Why Star Features Are Exclusive

THE patents listed below readily explain why the most valuable and important features are confined exclusively to and are to be found only in the STAR Line. The exclusive features without number which are controlled by our patents are evidence of the thought, of the ingenuity and of the years of hard work devoted to originating the STAR Line and bringing it to its present state of perfection.

The STAR Line is fully covered and protected by patents. As required by law, we hereby warn all infringers against any attempt to copy or duplicate STAR patented features.

We also warn the public against the use of such infringements, as the users, according to law, share the liability of those who make them.

Patent No.	Date	Invention
792,254	June 13, 1905	Track
786,350	April 4, 1905	Stanchion
1,128,769	Feb. 16, 1915	Calf Pen
1,124,718	Jan. 12, 1915	Means for supporting members of Stalls and the like
1,122,711	Dec. 29, 1914	Stanchion
1,121,176	Dec. 15, 1914	Mangers
1,118,754	Nov. 24, 1914	Stall Construction
1,101,169	June 23, 1914	Stall Construction
1,095,148	April 28, 1914	Mangers
1,086,812	Feb. 10, 1914	Stall Side Construction
1,084,934	Jan. 20, 1914	Partition for Feed Troughs
1,083,605	Jan. 6, 1914	Stanchions
1,078,999	Nov. 18, 1913	Stall Construction
1,068,753	July 29, 1913	Stall Construction
1,066,195	July 1, 1913	Stanchion
1,066,194	July 1, 1913	Animal Stall
1,064,466	June 10, 1913	Stop Device for Stalls
1,057,720	April 1, 1913	Stall Construction
1,056,523	Mar. 18, 1913	Feed and Litter Carriers
Design 43,458	Jan. 21, 1913	Animal Pen
Design 43,457	Jan. 21, 1913	Animal Pen
1,034,774	Aug. 6, 1912	Stall and Manger
1,029,984	June 18, 1912	Feed and Litter Carriers
1,027,715	May 28, 1912	Feed and Litter Carriers
1,025,527	May 7, 1912	Hanger for Litter Carrier
1,007,934	Nov. 7, 1911	Stop Device for Carriers
1,006,837	Oct. 24, 1911	Swinging Track and Boom for Litter Carriers and the like
1,003,667	Sept. 19, 1911	Overhead Track
1,003,128	Sept. 12, 1911	Track for Litter Carriers
1,003,097	Sept. 12, 1911	Overhead Track
999,364	Aug. 1, 1911	Stanchion
997,716	July 11, 1911	Feed and Litter Carriers
989,899	April 18, 1911	Overhead Switch
988,561	April 4, 1911	Animal Stalls
983,615	Feb. 7, 1911	Track and Means for Supporting same
983,614	Feb. 7, 1911	Feed and Litter Carriers
969,465	Sept. 6, 1910	Swinging Track and supporting Boom therefor
924,154	June 8, 1909	Feed and Litter Carriers
913,881	Mar. 2, 1909	Feed and Litter Carriers
906,798	Dec. 12, 1908	Litter Carrier
888,878	May 26, 1908	Feed and Litter Carriers
884,649	April 24, 1908	Feed and Litter Carriers
866,269	Sept. 17, 1907	Feed and Litter Carriers
862,460	Aug. 6, 1907	Feed and Litter Carriers
815,521	Mar. 20, 1906	Feed and Litter Carriers
1,210,159	Dec. 26, 1916	Animal Stall
1,208,118	Dec. 12, 1916	Stall Construction
1,207,286	Dec. 5, 1916	Stall Construction
1,197,194	Sept. 5, 1916	Animal Stall
1,197,193	Sept. 5, 1916	Animal Stall
1,172,236	Feb. 15, 1916	Animal Stall
1,162,286	Nov. 20, 1915	Cattle Watering Device
1,160,589	Nov. 16, 1915	Stall Construction
1,160,588	Nov. 16, 1915	Cattle Watering Device

Patent No.	Date	Invention
1,156,472	Oct. 12, 1915	Overhead Track Joint and supporting means therefor
1,151,256	Aug. 24, 1915	Means for supporting members of Stalls and the like
1,145,474	July 6, 1915	Stall Construction
1,239,170	Sept. 4, 1917	Hog Pen
1,235,453	July 31, 1917	Track for Door Hangers
1,226,201	May 15, 1917	Bull Staff
1,225,320	May 8, 1917	Stall Construction
1,291,457	Jan. 14, 1919	Hay Carrier
1,288,861	Dec. 24, 1918	Door and Track
1,283,712	Nov. 5, 1918	Pig Guard
1,282,403	Oct. 22, 1918	Overhead Track
1,271,454	July 2, 1918	Overhead Track
1,256,457	Feb. 12, 1918	Stall Frame Construction
1,251,207	Dec. 25, 1917	Door Latch
1,250,574	Dec. 18, 1917	Fastener for Door
1,241,364	Sept. 25, 1917	Gate for Stall Construction
702,295	June 10, 1902	Wire Stretcher
767,336	Aug. 9, 1904	Wire Stretcher
770,520	Sept. 20, 1904	Tackle Block
775,080	Nov. 15, 1904	Wire Stretcher
803,052	Oct. 31, 1905	Wire Stretcher
804,461	Nov. 14, 1905	Wire Stretcher
835,786	Nov. 13, 1906	Stretcher for Woven Wire Fences
844,718	Feb. 19, 1907	Wire Stretcher
809,913	Jan. 9, 1906	Wagon
809,912	Jan. 9, 1906	Wagon
815,520	Mar. 20, 1906	Wheel
835,785	Nov. 13, 1906	Wagon
862,459	Aug. 6, 1907	Wagon
887,385	May 12, 1908	Toy Wagon
797,507	Aug. 15, 1905	Tank Heater
1,023,463	April 16, 1912	Tank Heater
48,467	Jan. 18, 1916	Tank Heater
1,158,911	Nov. 2, 1915	Fence Post
731,351	June 16, 1903	Hay Rack Construction
761,882	June 7, 1904	Hay Rack Construction
799,980	Sept. 19, 1905	Means for connecting the Members of Hay Racks
740,637	Oct. 6, 1903	Snapping Rolls
757,607	April 19, 1904	Spring Hinge
717,562	Jan. 6, 1903	Weldless Link
731,558	June 23, 1903	Hay Carrier
753,481	Mar. 1, 1904	Hanger and Track
795,902	Aug. 1, 1905	Fork Pulley Frame
826,095	July 17, 1906	Hay Carrier
835,186	Nov. 6, 1906	Hay Carrier
835,185	Nov. 6, 1906	Hay Carrier
844,719	Feb. 19, 1907	Hay Carrier
865,689	Sept. 10, 1907	Hay Carrier
971,741	Oct. 4, 1910	Hay Carrier
1,101,170	June 23, 1914	Hay Carrier
1,126,435	Jan. 26, 1915	Hay Carrier
1,194,729	Aug. 15, 1916	Hook
1,207,285	Dec. 5, 1916	Hay Carrier
709,314	Sept. 16, 1902	Track for Door Hangers
731,350	June 16, 1903	Door Hanger
806,882	Dec. 12, 1905	Door Hanger
837,819	Dec. 4, 1906	Track
902,221	Oct. 27, 1908	Track for Door Hangers
908,849	Jan. 5, 1909	Track for Door Hangers
919,288	April 20, 1909	Door Hanger and Track
977,118	Nov. 29, 1910	Method for Making Slotted Tubular Tracks
994,448	June 6, 1911	Track for Door Hangers
1,010,781	Dec. 5, 1911	Door Hangers and Track
1,027,714	May 28, 1912	Door Hanger
1,032,056	July 9, 1912	Track for Barn Door Hangers
1,027,713	May 28, 1912	Door Hanger Track
1,104,353	July 21, 1914	Barn Door Track
1,178,065	April 4, 1916	Door Hanger
1,185,189	May 30, 1916	Door Hanger

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